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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

January 2000

Data Assimilation
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Berkshire
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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA :NOBS $\geq$ 20 , and one or more of the following:

1.|bias| $\geq$ 4 hPa (pressure),
$\geq$ 5 $m\ s^{-1}$ (wind speed),
$\geq$ 30 degrees (direction).

2.SD $\geq$ 6 hPa (pressure),
$\geq$ 80 degrees (direction).

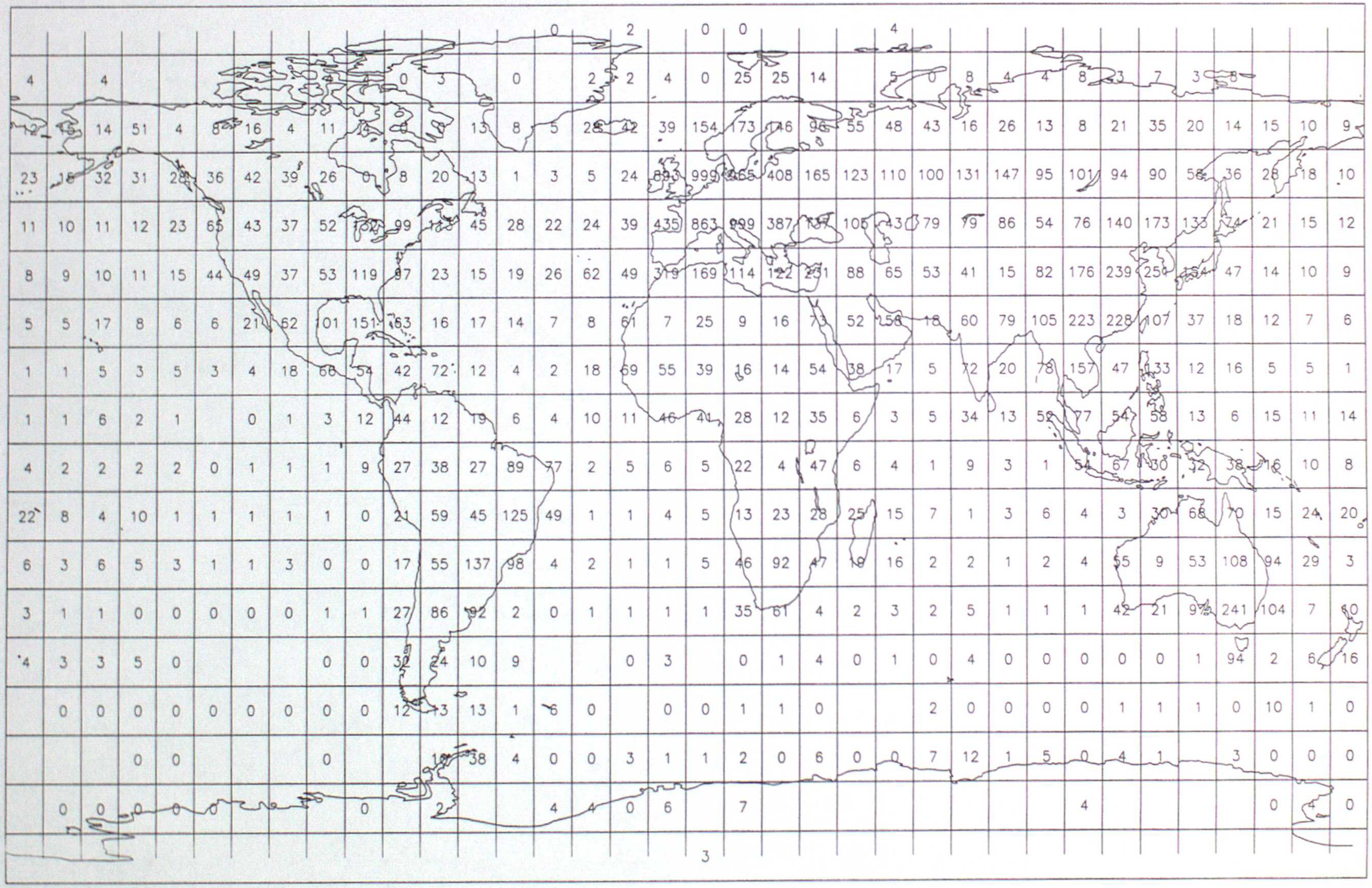
3.PGE $\geq$ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
DLHV	ALL	P	SUR	29	1	3	5.4	-4.5	7.0
ELMQ	ALL	P	SUR	22	0	0	2.5	-5.0	5.6
ELTQ6	ALL	P	SUR	22	17	77	1.6	-12.4	12.5
ELUB5	ALL	P	SUR	28	0	0	1.3	7.3	7.4
ELVI2	ALL	P	SUR	79	0	0	2.6	-5.5	6.1
ELVJ9	ALL	P	SUR	96	0	0	1.5	-4.6	4.8
LAEP4	ALL	P	SUR	51	1	2	0.8	-5.2	5.2
LAFQ5	ALL	P	SUR	24	0	0	2.6	-5.8	6.4
PCCQ	ALL	P	SUR	51	0	0	1.0	-6.3	6.4
P3JF2	ALL	P	SUR	25	0	0	5.3	-6.0	8.0
P3NK5	ALL	P	SUR	21	0	0	1.4	4.8	5.0
P3YS5	ALL	P	SUR	71	2	3	1.6	4.6	4.9
UAST	ALL	P	SUR	21	0	0	1.4	-4.0	4.2
UAZB	ALL	P	SUR	20	1	5	6.3	2.7	6.9
UBHT	ALL	P	SUR	27	20	74	5.5	-2.7	6.1
UCAD	ALL	P	SUR	40	0	0	2.4	-5.1	5.6
UCDM	ALL	P	SUR	25	8	32	6.6	1.4	6.7
UCJB	ALL	P	SUR	22	4	18	1.9	-6.9	7.2
UCJL	ALL	P	SUR	63	1	2	1.7	6.6	6.8
UIAE	ALL	P	SUR	25	0	0	4.2	4.0	5.8
WDZB	ALL	P	SUR	42	0	0	0.8	-5.6	5.7
ZCAM9	ALL	P	SUR	49	0	0	5.4	4.7	7.2
3FGN3	ALL	P	SUR	28	0	0	0.7	-9.6	9.6
3FXE7	ALL	P	SUR	28	21	75	5.1	-3.9	6.4
WIND SPEED									
C6NI3	ALL	SPEED	SUR	38	0	0	5.0	13.6	14.5
DGCDFD	ALL	SPEED	SUR	41	0	0	6.3	9.8	11.7
DGFA	ALL	SPEED	SUR	25	0	0	5.8	8.6	10.3
ELVK2	ALL	SPEED	SUR	84	0	0	6.9	6.6	9.5
ELWC6	ALL	SPEED	SUR	71	0	0	6.9	8.9	11.2
ELXK6	ALL	SPEED	SUR	30	0	0	4.4	9.7	10.7
FNJI	ALL	SPEED	SUR	47	0	0	5.1	5.6	7.6
PFKV	ALL	SPEED	SUR	48	0	0	7.6	6.0	9.7
P3GB4	ALL	SPEED	SUR	88	0	0	3.1	5.0	5.9
SGAK	ALL	SPEED	SUR	27	0	0	5.4	5.4	7.7
UCJD	ALL	SPEED	SUR	48	0	0	4.5	5.6	7.2
VRUM3	ALL	SPEED	SUR	21	0	0	3.1	5.0	5.9
V2CC	ALL	SPEED	SUR	22	0	0	6.7	7.8	10.3
V2DW	ALL	SPEED	SUR	29	0	0	2.9	7.4	7.9
ZCAX8	ALL	SPEED	SUR	23	0	0	8.7	11.9	14.7
ZTSG	ALL	SPEED	SUR	28	0	0	5.6	6.7	8.7
3FSH4	ALL	SPEED	SUR	22	0	0	4.1	5.4	6.8
3FSL4	ALL	SPEED	SUR	42	0	0	2.6	6.3	6.9
3FWM4	ALL	SPEED	SUR	107	0	0	4.1	6.1	7.3
9VIH	ALL	SPEED	SUR	33	0	0	5.2	7.8	9.4
WIND DIRECTION									
ELWT7	ALL	DIRN.	SUR	234	0	0	88.2	-13.1	89.2
UAHV	ALL	DIRN.	SUR	32	0	0	44.0	-36.7	57.3
46023	ALL	DIRN.	SUR	120	0	0	18.4	-30.8	35.9
46061	ALL	DIRN.	SUR	1053	0	0	32.5	-30.1	44.3
51018	ALL	DIRN.	SUR	48	0	0	13.5	35.3	37.8
62112	ALL	DIRN.	SUR	119	0	0	85.1	-3.7	85.2
62303	ALL	DIRN.	SUR	388	0	0	66.4	43.7	79.5

AVAILABILITY – SHIP/SYNOP – JANUARY 2000
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 21321

FIGURE 1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8 9 10 11 15 44 49 37 53 119 97 23 15 19 26 62 49 319 169 114 122 251 88 65 53 41 15 82 176 239 250 134 47 14 10 9
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6 3 6 5 3 1 1 3 0 0 17 55 137 98 4 2 1 1 5 46 92 47 19 16 2 2 1 2 4 55 9 53 108 94 29 3
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3

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|
≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).

2.SD
≥ 6 hPa (pressure),
≥ 80 degrees (direction).

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
14917	-30.7	32.8	ALL	P	SUR	38	12	32	3.9	-9.4	10.2
21902	58.5	-157.1	ALL	P	SUR	41	1	2	6.8	-2.8	7.3
22902	65.3	-144.8	ALL	P	SUR	47	47	100			
31953	-20.8	-40.7	ALL	P	SUR	745	13	2	2.8	10.5	10.8
41853	35.1	-68.4	ALL	P	SUR	277	0	0	3.3	4.8	5.8
44513	45.3	-46.2	ALL	P	SUR	54	10	19	6.7	-1.3	6.8
44516	47.4	-32.4	ALL	P	SUR	217	71	33	2.8	0.8	2.9
44517	48.4	-31.8	ALL	P	SUR	128	128	100			
46768	57.0	-140.9	ALL	P	SUR	375	36	10	5.5	4.1	6.9
46910	32.3	-165.3	ALL	P	SUR	30	30	100			
46923	21.4	-157.8	ALL	P	SUR	126	0	0	0.8	-5.9	6.0
52905	10.1	177.7	ALL	P	SUR	156	1	1	3.7	-4.8	6.1
54921	-45.1	-149.4	ALL	P	SUR	154	19	12	6.2	6.8	9.2
61537	40.7	6.9	ALL	P	SUR	1016	462	45	3.3	-0.3	3.3
62510	48.9	-10.4	ALL	P	SUR	504	6	1	6.1	-4.2	7.4
62554	34.1	-14.0	ALL	P	SUR	99	99	100			
WIND SPEED											
21612	27.7	129.0	ALL	SPEED	SUR	28	0	0	2.5	-7.1	7.5
52643	14.9	159.3	ALL	SPEED	SUR	94	0	0	8.9	7.7	11.7
WIND DIRECTION											
56505	-21.9	109.8	ALL	DIRN.	SUR	224	0	0	25.2	-35.1	43.2

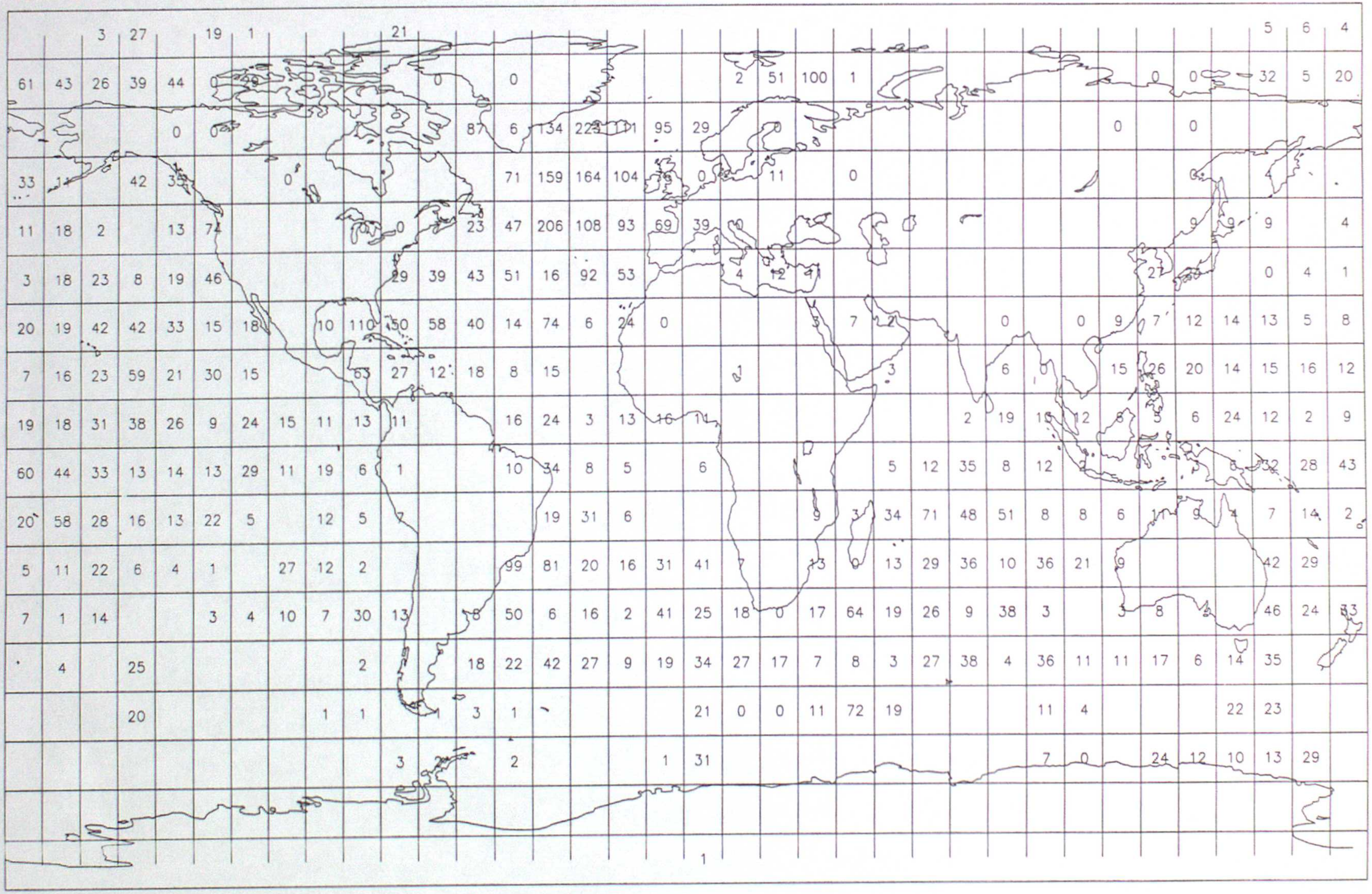
AVAILABILITY – DRIFTER – JANUARY 2000

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 7705

FIGURE 2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5 11 22 6 4 1 27 12 2 99 81 20 16 31 41 7 13 0 13 29 36 10 36 21 9 42 29
7 1 14 3 4 10 7 30 13 8 50 6 16 2 41 25 18 0 17 64 19 26 9 38 3 3 8 46 24 33
4 25 2 18 22 42 27 9 19 34 27 17 7 8 3 27 38 4 36 11 11 17 6 14 35
20 1 1 1 3 1 21 0 0 11 72 19 11 4 22 23
3 2 1 31 7 0 24 12 10 13 29
1

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	109	1	1	0	0.7	5.1	5.1
60468	35.6N	6.2E	1052	S8	117	117	100	0			
60511	35.3N	1.4E	1127	S8	106	101	95	0	0.1	14.8	14.8
60535	34.7N	3.3E	1144	S8	77	0	0	0	0.7	-6.2	6.2
60670	24.6N	9.5E	1054	S8	108	2	2	0	0.9	10.0	10.0
63333	11.1N	39.7E	1903	MS	27	0	0	0	0.6	5.7	5.7
63334	10.3N	37.7E	2515	MS	26	0	0	0	0.7	10.8	10.8
63450	9.0N	38.8E	2354	MS	36	0	0	0	0.4	5.0	5.0
63471	9.6N	41.9E	1260	MS	34	0	0	0	0.7	11.6	11.6
63478	5.9N	43.6E	295	MS	23	0	0	9	3.0	4.4	5.3
63602	3.1N	30.9E	1204	S	34	33	97	0	0.0	-10.7	10.7
63680	0.3N	32.6E	1144	S	23	0	0	100	0.6	-8.6	8.6
68030	18.5S	25.6E	1071	8	61	0	0	0	0.9	4.3	4.4
68106	23.6S	15.1E	407	S	71	30	42	0	0.6	0.8	1.0
68338	26.9S	24.6E	1234	S8	43	39	91	2	1.7	-0.3	1.7
68396	26.5S	31.3E	641	S8	57	1	2	2	0.7	5.3	5.3
68530	29.1S	23.8E	994	S8	53	21	40	2	1.4	2.9	3.2
68546	30.8S	26.9E	1347	S8	42	41	98	0	0.0	2.0	2.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	402	M	118	16	14	0	3.9	7.7	8.6
24688	63.3N	143.2E	741	MS	113	37	33	0	4.5	5.2	6.9
30253	57.9N	114.2E	275	MS	118	0	0	17	3.4	6.2	7.1
30320	56.9N	105.7E	669	MS	119	59	50	0	2.2	4.3	4.8
30372	56.9N	118.3E	711	MS	124	3	2	7	5.2	5.5	7.6
30627	53.1N	105.5E	762	MS	58	0	0	0	1.7	-4.7	5.0
30664	53.5N	115.6E	811	MS	31	0	0	3	1.9	-4.4	4.8
30669	53.1N	117.5E	708	MS	22	0	0	0	1.1	-6.0	6.1
30741	52.8N	110.0E	1286	S8	122	4	3	39	2.3	-5.2	5.7
30811	51.7N	102.5E	721	MS	124	1	1	34	4.4	4.2	6.1
30815	51.5N	103.6E	1442	S8	53	0	0	2	1.8	-4.0	4.4
30967	49.9N	115.8E	623	MS	89	1	1	0	2.7	-5.4	6.0
31123	57.8N	130.9E	255	MS	62	0	0	39	2.1	4.4	4.9
31474	51.6N	133.3E	384	MS	118	3	3	0	3.8	4.1	5.6
31532	50.9N	132.3E	272	MS	114	1	1	35	2.9	4.8	5.6
40701	39.3N	44.4E	1470	MS	20	1	5	5	1.0	7.9	8.0
40743	36.2N	57.7E	941	MS	106	1	1	0	1.1	-4.7	4.8
40762	35.3N	59.2E	1333	MS	100	13	13	1	1.2	-12.5	12.6
41254	23.1N	57.7E	1755	S8	89	89	100	0			
41396	16.0N	48.9E	700	MS	23	0	0	0	0.9	7.4	7.5
44212	50.0N	92.1E	940	MS	93	1	1	35	3.5	5.5	6.5
44239	48.8N	103.6E	1209	MS	88	1	1	1	1.0	-4.4	4.5
44256	49.6N	114.4E	706	MS	84	3	4	7	1.9	-5.2	5.5
44313	47.6N	118.6E	689	MS	86	2	2	10	1.7	-4.5	4.8
44416	28.6N	81.6E	720	MS	68	1	1	4	1.7	4.9	5.2
47022	40.8N	128.2E	1200	S	24	0	0	0	1.6	4.6	4.9
51334	44.6N	82.9E	321	M	122	22	18	25	3.1	9.1	9.6
51379	44.0N	89.6E	794	M	122	7	6	24	3.1	8.9	9.4
51495	43.5N	91.6E	874	M	123	20	16	12	2.2	11.7	11.9
51730	40.5N	81.1E	1013	M	122	0	0	5	1.8	4.2	4.6
51818	37.6N	78.3E	1376	M	122	0	0	13	2.9	5.5	6.2
52378	41.4N	102.4E	960	M	123	0	0	30	2.1	4.3	4.8
52602	38.8N	93.4E	2734	S	124	0	0	0	1.4	-4.1	4.3
52955	35.6N	100.8E	3201	S	124	4	3	1	0.8	13.2	13.2
53083	44.6N	114.2E	1183	M	123	3	2	28	3.0	7.0	7.6
53352	41.7N	110.4E	1377	M	123	6	5	15	3.7	7.3	8.2
53480	41.0N	113.1E	1416	M	123	1	1	50	3.5	5.7	6.7
53487	40.1N	113.3E	1069	M	124	1	1	31	2.8	5.2	5.9
53502	39.8N	105.8E	1033	M	123	0	0	54	2.4	4.7	5.3

53588	39.0N	113.5E	2898	S	124	124	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
53593	39.8N	114.6E	910	M	123	0	0	31	2.6	4.4	5.1
53673	38.8N	112.7E	838	M	123	0	0	2	2.4	4.2	4.8
53705	37.5N	105.7E	1185	M	123	0	0	16	1.9	5.2	5.5
53764	37.5N	111.1E	951	M	123	1	1	3	1.8	4.0	4.4
54115	43.6N	118.1E	800	M	124	0	0	13	2.3	4.4	5.0
54186	43.4N	128.2E	526	M	122	0	0	22	1.8	4.2	4.6
54308	41.2N	116.6E	661	M	123	0	0	6	2.2	4.6	5.1
54311	41.9N	117.8E	844	M	124	0	0	6	2.4	4.7	5.3
54386	41.4N	128.2E	1018	M	122	1	1	19	3.5	6.5	7.4
54587	39.1N	123.2E	-69	M	101	0	0	0	0.8	-4.9	5.0
56287	30.0N	103.0E	629	M	123	0	0	0	1.6	4.0	4.3
56385	29.5N	103.3E	3049	S	124	0	0	8	2.2	-5.3	5.7
56444	28.5N	98.9E	3488	S	123	52	42	18	0.7	13.7	13.7
56462	29.0N	101.5E	2994	S	122	4	3	2	1.7	9.1	9.3
57006	34.6N	105.8E	1143	M	123	0	0	0	1.6	4.8	5.1
57016	34.3N	107.1E	610	M	123	0	0	29	1.7	4.1	4.4
57816	26.6N	106.7E	1074	MS	124	69	56	98	2.5	-13.9	14.1

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	55	0	0	2	1.4	-6.8	6.9
82704	7.6S	72.7W	170	MS	83	0	0	0	1.6	-4.2	4.5
83214	10.3S	54.9W	285	MS	83	0	0	0	3.7	-4.7	6.0
83235	12.4S	46.4W	604	MS	89	1	1	3	1.5	7.0	7.2
83319	14.7S	52.4W	315	MS	86	0	0	1	1.4	-4.6	4.8
83332	14.1S	46.4W	826	MS	90	9	10	0	0.9	13.5	13.5
83408	14.3S	43.8W	447	MS	78	1	1	1	0.8	10.9	10.9
83423	16.7S	49.3W	741	MS	87	2	2	1	0.9	-4.6	4.7
83488	17.8S	42.9W	1097	MS	86	86	100	0			
83531	18.6S	46.5W	940	MS	65	0	0	0	1.0	-6.2	6.3
83587	19.9S	43.9W	850	MS	89	0	0	0	0.8	-6.9	6.9
83704	22.3S	53.9W	369	MS	86	0	0	34	1.6	-9.0	9.1
83773	23.1S	48.9W	793	MS	45	0	0	0	0.9	-10.2	10.2
83836	25.5S	50.6W	837	MS	87	0	0	0	0.8	-4.9	5.0
83953	30.9S	55.5W	231	MS	89	0	0	0	1.1	-10.7	10.8
84425	5.9S	76.1W	179	MS	33	0	0	0	1.4	4.9	5.1
84455	6.5S	76.4W	281	MS	48	1	2	0	1.2	4.3	4.5
84472	7.1S	78.5W	2620	S	34	0	0	3	0.9	-6.1	6.2
84474	7.2S	76.7W	350	S	32	1	3	53	1.4	9.5	9.6
84542	9.4S	77.6W	2750	S	29	0	0	55	1.4	4.1	4.3
84686	13.6S	72.0W	3248	S	67	0	0	0	0.7	-4.7	4.8
84688	13.7S	73.4W	3444	S	27	0	0	59	1.8	-9.9	10.1
84782	18.1S	70.3W	468	MS	69	0	0	1	1.3	6.9	7.0
85141	14.5S	67.6W	204	MS	56	0	0	9	2.6	4.7	5.4
85153	14.9S	65.6W	160	MS	44	0	0	57	2.1	5.1	5.5
85230	17.6S	69.6W	4054	S	53	1	2	25	1.5	5.1	5.3
85264	18.5S	64.1W	1998	S	54	1	2	100	1.8	-5.9	6.2
85312	19.8S	63.9W	992	S	41	3	7	0	1.3	-9.8	9.9
85432	22.5S	68.9W	2320	S8	83	0	0	0	0.6	5.9	5.9

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70194	66.6N	145.3W	431	S	105	105	100	0			
71176	60.0N	64.2W	551	MS	124	0	0	13	1.8	-4.6	4.9
71177	57.1N	61.5W	834	MS	123	0	0	6	1.9	-4.2	4.6
71179	54.7N	58.4W	683	MS	124	0	0	29	2.3	-4.5	5.1
71434	55.2N	85.1W	10	S	69	20	29	0	1.4	-4.6	4.8

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71499	63.2N	101.8W	237	MS	55	1	2	40	6.1	5.7	8.3
71812	49.8N	77.8W	281	MS	81	74	91	38	4.7	5.1	6.9
76055	31.0N	114.9W	440	MS	56	56	100	0			
76118	30.4N	109.7W	1040	MS	33	0	0	0	0.6	-11.9	11.9
76632	20.1N	98.7W	2417	MS	40	0	0	0	0.6	-5.1	5.1
76658	19.2N	103.7W	494	MS	41	0	0	0	0.6	6.3	6.3
76750	18.5N	88.3W	9	MS	101	0	0	0	1.3	-8.9	9.0
76773	17.8N	97.8W	1680	MS	29	0	0	0	1.0	8.2	8.3
76775	17.1N	96.7W	1550	MS	68	0	0	0	0.7	4.4	4.5
76845	16.7N	92.6W	2276	MS	51	51	100	0			
78718	14.4N	87.6W	626	MS	53	48	91	21	0.1	-14.9	14.9

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91163	21.9N	159.6W	7	8	365	365	100	0			
92010	6.1S	145.4E	1587	M	47	0	0	0	0.7	10.1	10.1
94576	27.5S	153.0E	38	MS	107	0	0	100	0.7	8.0	8.0
95611	34.6S	118.5E	107	MS	101	1	1	15	2.7	8.6	9.0
95909	36.5S	148.3E	1957	MS	123	123	100	0			
96801	7.3S	108.3E	335	M	32	8	25	0	0.8	1.8	2.0
96881	7.6S	111.5E	110	M	35	1	3	20	4.9	4.1	6.4

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
06255	61.2N	1.1E	47	M	185	0	0	32	1.1	5.5	5.6
10557	50.5N	11.1E	845	S8	372	372	100	0			
10954	47.8N	10.9E	540	S8	166	166	100	9			
11185	47.5N	16.0E	991	S8	96	52	54	2	0.9	-1.9	2.1
12140	54.4N	18.7E	2	MS	121	0	0	33	0.9	7.8	7.9
12510	50.7N	15.7E	1603	S8	121	0	0	73	2.3	-4.7	5.2
13269	44.3N	19.9E	176	MS	105	0	0	23	1.3	8.6	8.7
13581	41.2N	21.5E	-9999	8	83	0	0	47	1.4	-5.1	5.3
13584	41.7N	21.5E	2540	7	76	1	1	76	2.8	-4.4	5.2
13593	41.3N	22.4E	1031	8	66	0	0	29	1.5	-7.1	7.3
14554	44.9N	18.4E	140	S	36	0	0	25	1.1	-12.9	12.9
14650	43.8N	18.0E	967	S	35	1	3	0	0.7	-6.5	6.5
16227	41.9N	13.6E	655	MS	371	335	90	0	1.8	-13.0	13.1
16470	36.8N	12.0E	191	MS	70	0	0	4	0.9	-4.1	4.2
17042	41.4N	41.4E	33	M	119	0	0	14	1.9	4.3	4.7
17092	39.8N	39.5E	1218	S8	122	0	0	0	1.7	8.7	8.9
17203	38.9N	40.5E	1177	S8	111	0	0	0	1.5	4.6	4.8

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89108	89.0S	1.0W	2755	S	291	0	0	0	0.8	4.9	5.0
89266	72.2S	60.3W	91	S	245	215	88	0	1.2	-13.1	13.2
89327	73.2S	127.1W	30	S	247	196	79	0	9.0	-0.6	9.0
89612	66.3S	110.8E	390	S	232	232	100	0			
89744	74.0S	43.0E	3353	S	279	0	0	0	0.7	7.3	7.3
89769	78.5S	168.4E	50	S	403	403	100	9			
89847	67.6S	146.0E	30	S	319	0	0	0	1.3	-8.4	8.5
89872	78.0S	170.8E	45	S	278	0	0	0	0.8	6.8	6.8

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:70.0 - 500.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	52	0	44	2.8	1.6	49	2	45	0	9.8	3.2
AAH	135	1	25	1.5	0.4	121	0	24	0	10.8	2.6
AAL	6525	1	15	1.6	0.1	6518	0	16	0	9.2	0.9
AAR	1695	0	6	2.0	-0.5	1678	0	7	0	8.6	0.5
ACA	2248	0	4	2.0	0.1	2282	0	4	0	8.1	0.7
ACI	40	10	50	2.3	1.5	40	8	50	0	6.2	1.0
AEA	433	1	3	2.2	1.1	415	0	4	0	8.9	0.5
AEL	848	0	42	1.9	-1.0	855	0	11	0	9.1	0.5
AEY	261	3	6	2.1	0.7	263	0	5	0	9.1	0.7
AFL	543	1	3	2.0	0.4	543	1	4	0	10.0	0.5
AFR	2138	1	8	1.8	0.0	2183	0	8	0	8.6	0.8
AIH	346	2	6	1.8	-0.1	353	0	5	0	9.2	1.1
AJM	124	1	4	2.1	-0.2	123	0	2	0	8.0	0.6
AMM	204	0	5	1.5	0.4	210	0	8	0	8.8	0.4
AMT	748	1	62	2.0	0.8	751	0	39	0	8.8	0.5
AMX	366	3	6	2.0	0.2	364	1	7	0	10.7	0.6
ANA	1506	1	9	2.0	-0.1	1501	0	9	0	8.6	0.8
ANO	24	0	13	1.2	0.9	24	0	13	0	8.4	3.9
ANZ	4776	1	44	1.7	0.1	4718	0	44	0	7.9	1.2
AOM	1252	1	7	1.7	0.4	1261	0	7	0	8.3	0.8
ARG	64	2	22	3.4	0.9	66	2	15	0	7.6	1.0
AVA	628	0	4	2.0	0.4	636	0	5	0	8.6	0.4
AVE	177	1	4	1.9	0.8	177	0	4	0	9.7	1.1
AVN	103	2	31	1.1	0.2	105	0	31	0	7.7	0.8
AZA	638	1	37	2.3	0.4	631	0	5	0	8.8	1.0
BAF	22	0	5	2.2	-1.2	22	0	0	0	6.3	0.7
BAL	414	1	9	1.5	-0.1	420	0	10	0	8.4	1.1
BAW	1836	0	7	1.9	-0.1	1838	0	8	0	8.4	0.9
BBB	111	1	4	2.0	-0.1	106	0	1	0	7.6	0.7
BLX	58	0	2	1.9	-0.5	58	0	3	0	10.6	1.9
BWA	341	1	3	1.9	1.3	344	0	6	0	10.2	0.8
CAL	379	1	7	2.0	0.5	385	1	8	0	9.2	0.7
CCA	199	2	12	2.7	0.5	229	0	100	0	14.4	-0.1
CDN	2405	1	7	1.9	-0.1	2398	0	8	0	9.1	0.6
CES	366	0	7	2.1	0.0	375	2	72	0	10.3	0.0
CFC	36	0	6	1.8	0.5	35	0	6	0	7.2	2.2
CFG	1727	0	3	1.7	-0.7	1721	0	4	0	8.4	0.5
CKS	425	1	38	1.9	0.8	435	0	38	0	7.4	0.9
CKT	189	1	3	1.7	1.0	189	2	7	0	8.8	-0.3
CLX	287	1	5	1.8	-0.5	288	0	3	0	7.7	0.5
CMI	581	0	3	1.7	0.6	586	0	4	0	9.3	1.3
CMM	459	1	20	2.1	0.0	461	0	20	0	8.9	2.1
COA	1398	1	19	1.7	0.0	1437	0	21	0	11.3	1.6
CPA	53	0	11	1.4	0.4	53	0	11	0	7.3	2.0
CRL	1071	1	5	1.7	0.7	1069	0	5	0	8.5	0.9
CSN	116	0	6	1.9	0.7	118	1	8	0	8.2	-0.5
CTB	222	0	3	1.7	-0.2	218	0	3	0	8.5	0.7
CUB	410	0	4	2.1	1.3	415	0	5	0	9.6	0.7
DAL	4084	0	29	1.7	0 2	4122	0	30	0	9.0	0.9
DBY	667	0	3	1.5	-0.5	657	0	5	0	8.8	0.8
DCS	40	0	8	1.7	-0.2	40	0	10	0	9.5	0.7
DLH	2445	0	4	1.7	0.0	2442	0	5	0	8.6	0.8
EEZ	243	3	81	4.1	2.4	241	1	15	0	10.4	1.4
EIA	193	3	39	1.6	0.7	186	0	38	0	8.8	0.4
EIN	22	0	0	1.9	-0.9	23	0	0	0	6.4	1.1
ELY	121	3	5	1.7	-0.1	128	0	5	0	10.0	-0.4
ETH	36	0	11	1.0	0.1	37	0	11	0	7.5	1.5
EVA	1897	1	5	1.9	-0.3	1917	0	6	0	9.0	0.3
EWW	35	20	23	1.0	0.4	34	0	6	0	10.3	1.5

IDENT.	N.REP.	TEMPERATURE PG	PR	RMS	BIAS	WIND N.REP.	PG	PR	PC	RMS	BIAS
FDX	1450	1	16	1.8	0.5	1454	0	17	0	9.2	0.6
FIN	399	0	3	1.5	0.2	403	0	5	0	9.4	0.5
FJI	1029	10	45	1.9	0.8	940	0	40	0	9.3	1.0
FOM	453	18	51	1.7	0.4	376	1	40	0	7.4	1.2
FWQ	43	0	60	3.5	0.0	43	0	58	0	6.2	0.4
GAF	43	0	9	2.2	0.1	42	0	7	0	9.2	0.7
GCO	62	2	6	1.4	0.4	69	1	14	0	13.7	2.9
GHA	53	0	0	1.1	0.3	52	0	0	0	10.3	0.7
GIA	38	0	32	1.9	0.4	40	0	28	0	6.3	0.7
GRL	45	0	2	1.9	-0.1	46	0	2	0	6.4	1.5
GTI	152	1	5	1.7	0.0	161	0	8	0	10.3	0.8
HAL	3688	0	34	1.8	0.3	3657	0	35	0	10.3	1.1
HBI	25	0	4	2.4	0.7	26	0	12	0	9.6	0.1
HLF	113	1	4	1.8	-0.5	113	2	4	0	7.1	0.4
HLQ	35	0	23	1.3	1.1	33	0	24	0	6.4	1.6
HRH	355	16	73	1.4	-0.1	299	1	69	0	8.3	1.8
HVN	28	4	4	0.9	0.2	27	0	0	0	5.5	-0.4
IBE	2971	1	8	1.9	0.5	2918	0	9	0	9.7	0.8
ICE	1256	0	3	1.6	-0.1	1259	0	4	0	8.7	1.1
IWD	153	1	2	1.3	-0.5	151	1	2	0	7.1	1.7
JAA	108	0	1	2.3	1.6	108	0	1	0	7.8	2.0
JAL	7320	0	5	1.9	0.2	7312	0	6	0	8.9	1.2
JAZ	404	1	9	2.3	1.4	402	0	9	0	10.1	0.8
JKK	267	1	8	1.6	-0.1	240	1	10	0	9.6	0.8
KAI	23	0	43	3.2	0.2	23	0	43	0	10.2	3.4
KAL	3847	1	9	1.9	-0.2	3830	0	10	0	9.2	0.5
KLM	3287	0	10	1.8	0.4	3297	0	11	0	8.7	0.7
LAN	32	3	13	2.7	0.9	32	3	16	0	11.9	1.2
LAP	47	2	28	2.8	1.9	46	0	24	0	7.2	3.5
LDA	165	1	11	1.8	-0.1	164	1	10	0	8.7	1.0
LDI	1115	1	100	3.1	0.6	1127	0	9	0	8.9	0.4
LIB	549	0	2	1.7	0.8	550	0	2	0	7.6	0.8
LOT	180	1	4	2.2	-0.8	179	1	6	0	10.9	0.0
LPR	20	0	0	2.5	0.9	20	0	5	0	11.1	-1.2
LTU	805	1	5	1.9	-0.1	796	0	4	0	7.8	0.8
LXJ	43	0	21	1.8	0.8	41	0	22	0	7.6	0.4
MAS	531	1	9	1.8	0.3	548	0	9	0	8.9	0.3
MON	147	1	3	2.1	0.1	145	0	1	0	7.8	1.1
MPD	302	1	4	1.8	0.2	294	1	7	0	11.0	1.7
MPH	834	1	5	1.7	-0.6	834	1	6	0	9.1	0.6
NCA	657	0	2	1.8	0.3	649	0	3	0	8.5	0.7
NVR	54	0	6	2.4	0.3	54	0	6	0	9.2	0.8
NWA	10774	1	11	1.8	0.6	10707	0	12	0	9.1	0.9
OAL	26	4	8	2.1	0.9	27	0	0	0	7.8	2.1
PAC	270	1	43	1.6	0.2	276	0	28	0	7.6	1.3
PAL	1467	0	10	1.7	-0.2	1421	0	12	0	9.1	0.8
PAO	551	14	65	1.8	0.3	483	0	59	0	7.4	1.2
PUA	20	0	35	3.6	2.1	21	0	29	0	13.1	4.0
QFA	2094	1	57	1.7	0.3	2080	0	57	0	7.6	1.1
RAF	91	0	1	2.2	1.0	89	0	2	0	10.2	1.1
RAM	70	1	1	2.1	-0.5	70	0	1	0	7.1	-0.1
RCH	292	1	19	2.7	0.8	272	0	20	0	10.3	1.9
RJA	35	3	3	1.3	-0.5	34	0	3	0	7.9	1.5
RKA	142	1	13	2.2	-0.4	140	1	13	0	11.5	-0.2
RRR	110	2	15	2.2	-0.7	109	0	15	0	11.0	0.9
RYN	419	1	41	1.9	0.7	418	1	42	0	9.3	0.9
RZO	143	3	5	1.8	-0.4	142	0	5	0	10.2	2.4
SAA	283	0	5	1.8	-0.3	280	0	5	0	10.4	0.6
SAB	43	0	5	1.7	0.3	44	0	2	0	5.9	2.3

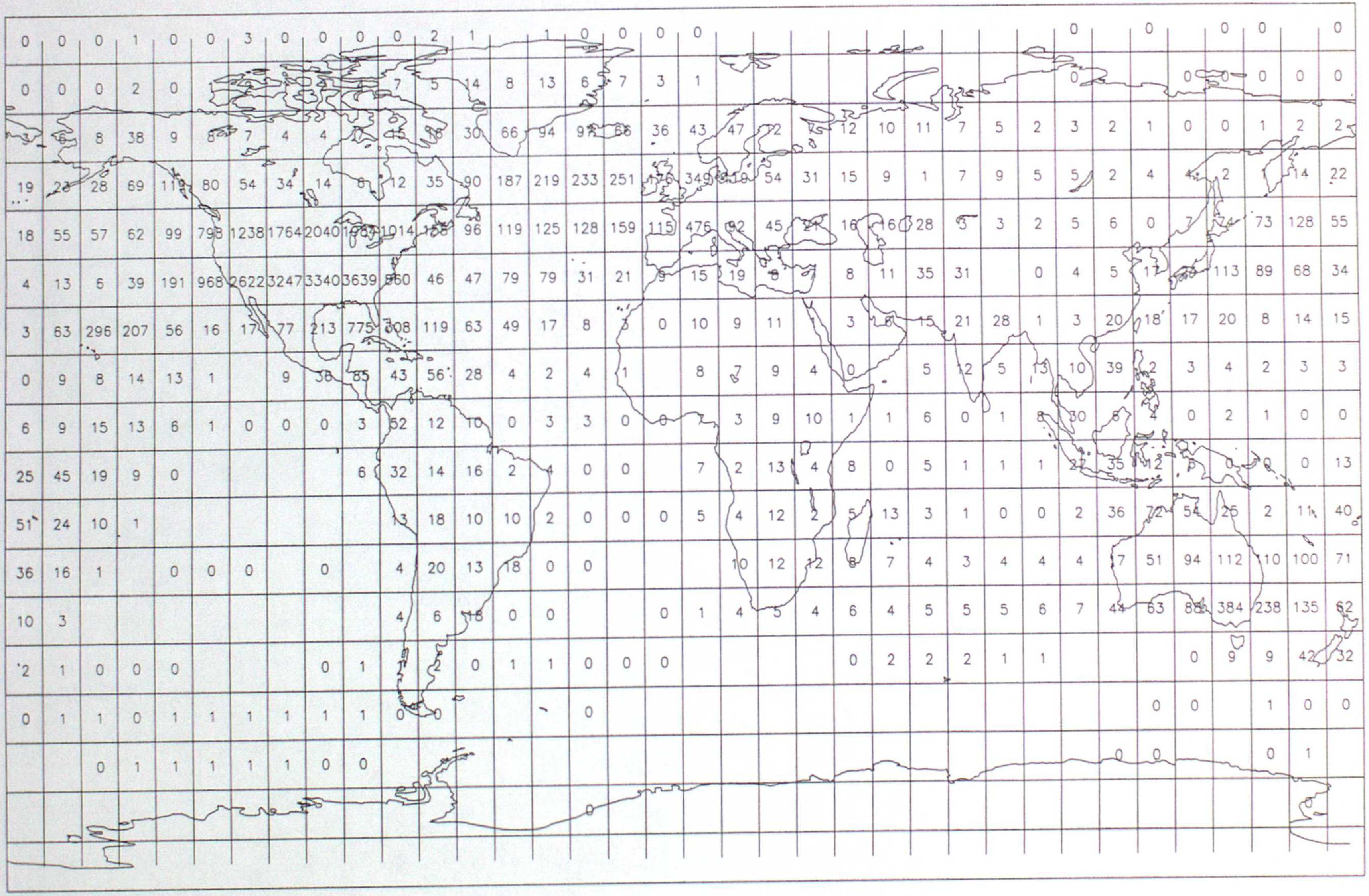
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SAS	1739	0	7	1.6	-0.4	1740	0	8	0	8.9	0.7
SIA	633	1	5	1.8	0.0	635	0	6	0	8.3	1.3
SLR	272	1	9	1.8	-1.1	271	0	10	0	8.9	-0.1
SNB	62	0	0	1.9	0.5	65	0	8	0	11.6	-0.3
SOL	58	2	5	1.4	0.9	57	0	5	0	9.2	2.1
SVA	158	2	4	1.8	-0.1	164	0	5	0	9.9	0.1
SWR	116	0	9	1.7	-0.1	120	0	8	0	8.7	1.4
TAP	545	2	5	1.6	-0.2	548	0	6	0	10.0	0.5
TCU	58	2	2	1.6	-0.9	57	0	2	0	8.5	0.5
THA	352	0	6	2.0	-0.8	357	1	8	0	8.4	0.1
THT	113	2	33	2.5	0.1	110	0	30	0	9.2	1.6
THY	22	0	9	1.5	-0.2	22	0	14	0	12.4	-0.3
TOW	108	0	1	1.9	0.5	108	1	7	0	10.1	1.8
TPA	34	0	9	1.5	0.2	36	0	8	0	7.4	-0.6
TSC	60	0	10	2.5	1.1	59	0	14	0	15.7	-0.7
TWA	1605	0	10	1.8	0.1	1536	0	9	0	7.6	1.1
UAL	78795	0	88	1.5	-0.1	78868	0	88	0	6.8	0.7
UPS	1350	1	21	2.0	0.6	1375	0	21	0	8.4	1.1
USA	351	1	5	2.2	0.0	292	0	6	0	9.4	0.7
VIR	754	0	3	1.8	-0.2	756	0	3	0	8.0	0.7
VKG	206	0	3	2.2	-0.4	207	0	2	0	7.1	0.9
VPB	40	0	30	2.3	0.7	41	0	29	0	12.5	0.5
VRG	179	0	17	1.6	0.9	182	0	18	0	9.8	1.8
VSP	47	2	13	1.2	0.7	48	0	13	0	8.2	0.4
VVR	74	3	31	3.0	1.3	97	0	28	0	10.1	0.5
WOA	144	0	10	1.7	0.1	158	0	10	0	7.5	0.7
AN	25114	0	19	1.6	0.5	25114	0	18	0	6.0	0.7
AR	3848	0	100	2.9	2.7	3795	0	4	0	6.5	1.4
BA	10502	0	8	1.6	0.6	10409	0	8	0	6.9	1.2
EU	36241	0	21	1.3	-0.2	36241	0	21	0	6.4	0.7
KL	6589	0	7	1.5	0.7	6560	0	7	0	7.2	1.3
LH	1183	0	6	1.9	1.2	1176	0	6	0	6.4	1.0
MK	4473	0	25	1.9	1.5	4453	0	6	0	7.4	1.3
NZ	3017	0	11	1.3	0.1	3017	0	11	0	6.3	0.8
QF	27410	0	13	1.5	0.6	27408	0	12	0	6.2	0.8
SA	3098	1	45	2.2	1.6	3095	0	5	0	7.4	0.9
SV	860	0	100	1.9	1.7	843	0	3	0	6.6	1.2
WA	380	7	17	2.3	0.6	374	7	100	0	15.1	-1.7
XX	3807	2	8	1.7	0.4	4359	1	68	0	11.7	0.9
N	1032	2	26	2.5	0.3	1055	0	27	0	9.9	1.1
US ACARS	562995	0	49	1.5	0.4	562512	0	49	0	6.6	1.0

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

FIGURE 3

JANUARY 2000

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED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18 55 57 62 99 793 1238 1764 2040 1987 1014 158 96 119 125 128 159 115 476 92 45 21 16 16 28 3 3 2 5 6 0 7 74 73 128 55
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3 63 296 207 56 16 17 77 213 775 308 119 63 49 17 8 3 0 10 9 11 1 3 6 15 21 28 1 3 20 18 17 20 8 14 15
0 9 8 14 13 1 9 36 85 43 56 28 4 2 4 1 8 7 9 4 0 5 12 5 13 10 39 2 3 4 2 3 3
6 9 15 13 6 1 0 0 0 3 52 12 10 0 3 3 0 0 7 3 9 10 1 1 6 0 1 8 30 8 4 0 2 1 0 0
25 45 19 9 0 6 32 14 16 2 4 0 0 7 2 13 4 8 0 5 1 1 1 27 35 12 5 0 0 0 13
51 24 10 1 13 18 10 10 2 0 0 0 5 4 12 2 5 13 3 1 0 0 2 36 72 54 25 2 11 40
36 16 1 0 0 0 0 4 20 13 18 0 0 10 12 12 8 7 4 3 4 4 4 17 51 94 112 110 100 71
10 3 4 6 18 0 0 0 1 4 5 4 6 4 5 5 5 6 7 44 63 88 384 238 135 62
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0 1 1 0 1 1 1 1 1 1 0 0 0 0 0 1 0 0
0 1 1 1 1 1 0 0 0 0 0 1
0

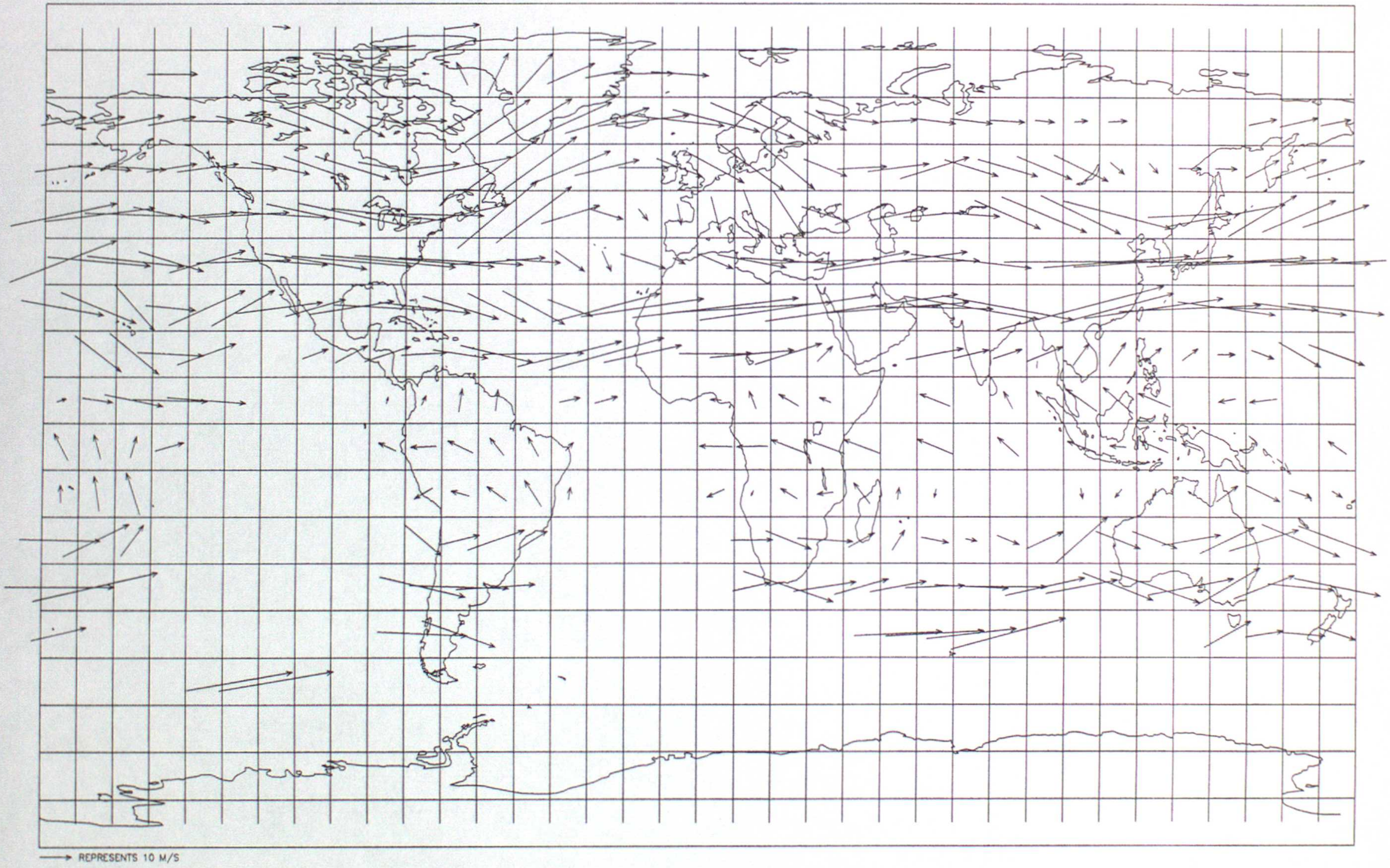
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

JANUARY 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



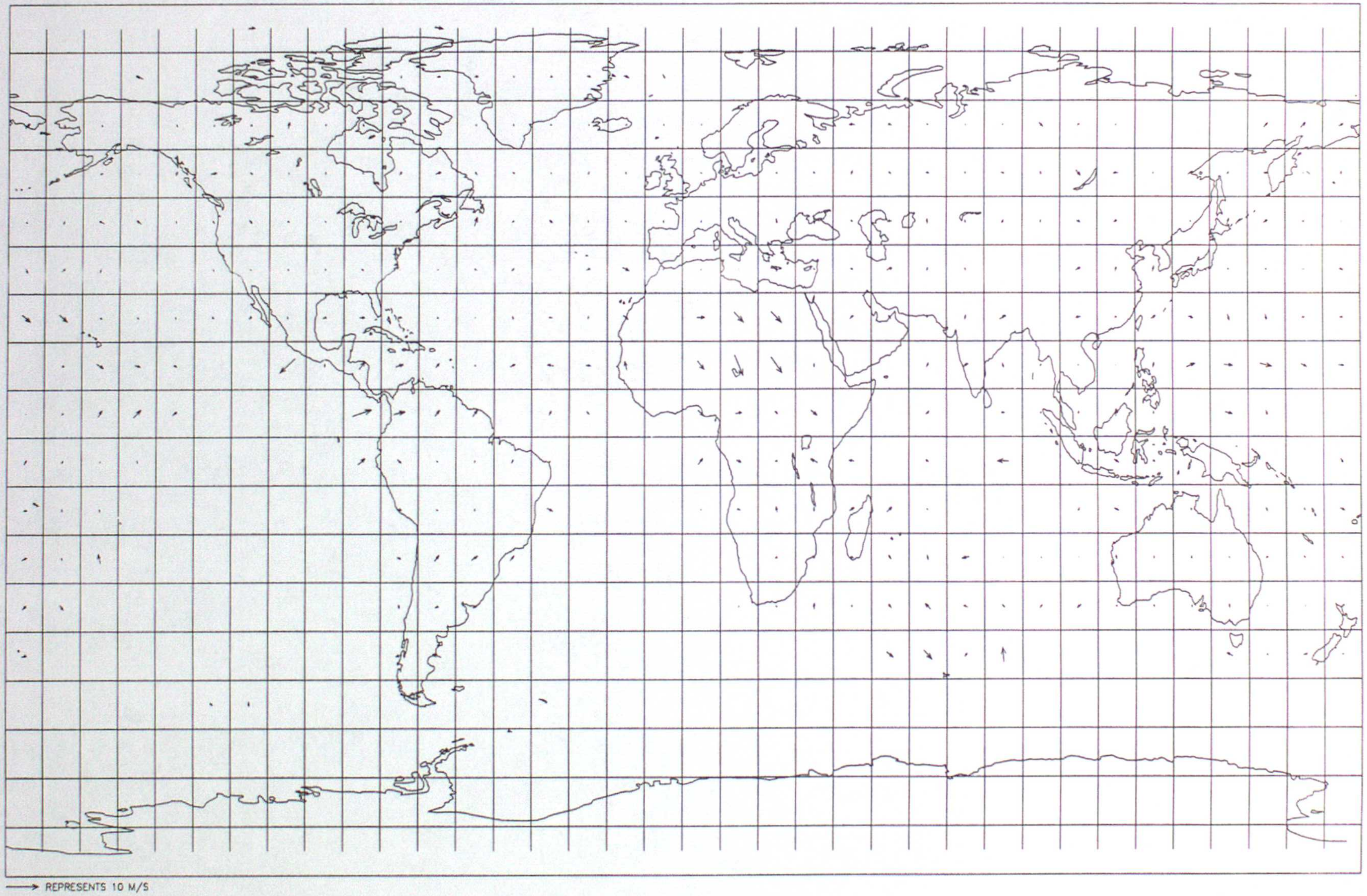
AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

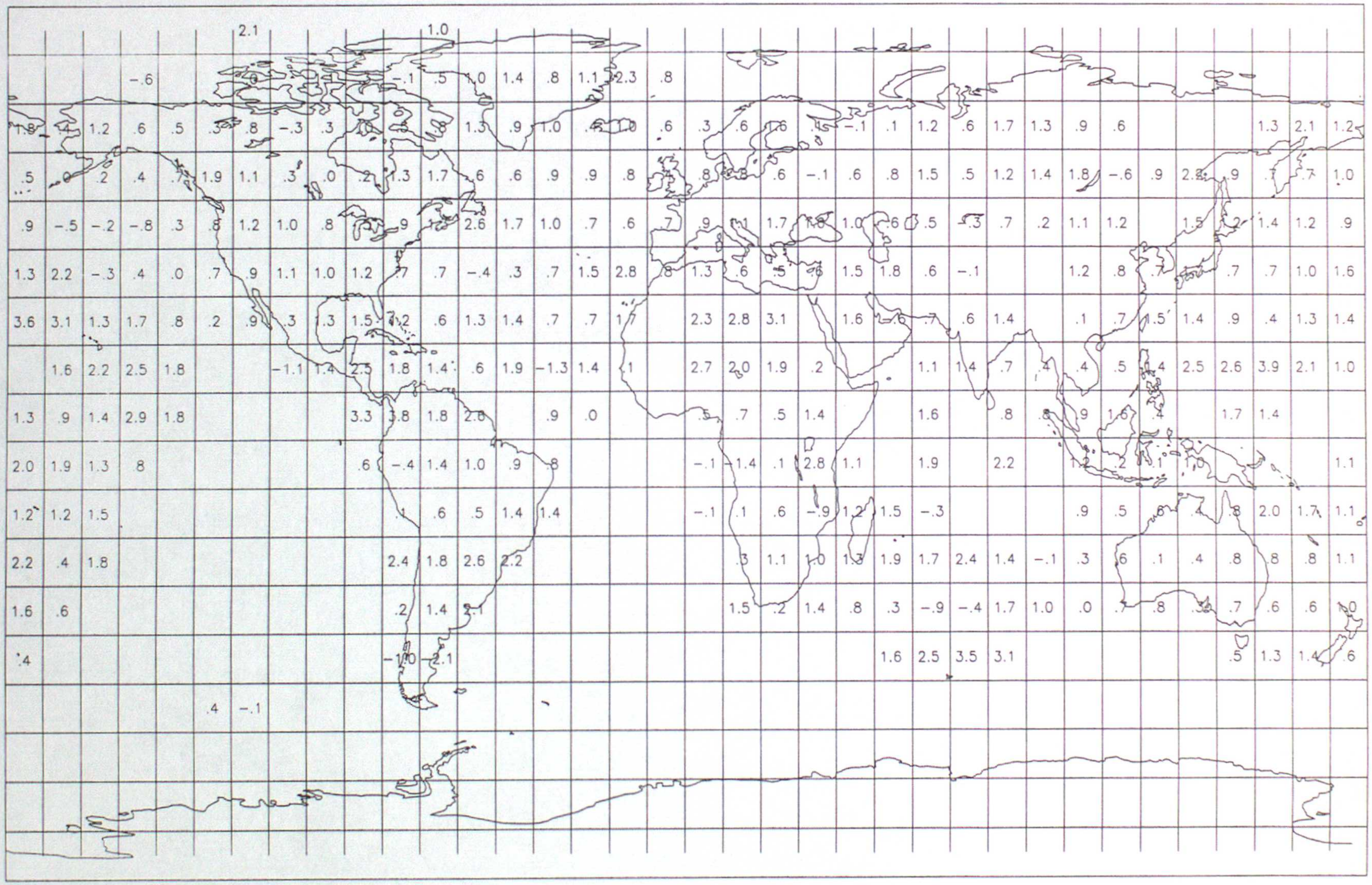
JANUARY 2000

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
JANUARY 2000
OBSERVATIONS WITH O-B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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-.6 -.1 .5 1.0 1.4 .8 1.1 2.3 .8
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.5 .0 .2 .4 .7 1.9 1.1 .3 .0 .2 1.3 1.7 .6 .6 .9 .9 .8 .8 .8 .6 -.1 .6 .8 1.5 .5 1.2 1.4 1.8 -.6 .9 2.2 .9 .7 .7 1.0
.9 -.5 -.2 -.8 .3 .8 1.2 1.0 .8 .9 1.2 2.6 1.7 1.0 .7 .6 .7 .9 1.1 1.7 1.8 1.0 .6 .5 .3 .7 .2 1.1 1.2 1.5 .2 1.4 1.2 .9
1.3 2.2 -.3 .4 .0 .7 .9 1.1 1.0 1.2 .7 .7 -.4 .3 .7 1.5 2.8 .8 1.3 .6 .5 .6 1.5 1.8 .6 -.1 1.2 .8 .7 .7 .7 1.0 1.6
3.6 3.1 1.3 1.7 .8 .2 .9 .3 1.3 1.5 1.2 .6 1.3 1.4 .7 .7 1.7 2.3 2.8 3.1 1.6 .6 .7 .6 1.4 .1 .7 1.5 1.4 .9 .4 1.3 1.4
1.6 2.2 2.5 1.8 -1.1 1.4 2.5 1.8 1.4 .6 1.9 -1.3 1.4 .1 2.7 2.0 1.9 .2 1.1 1.4 .7 .4 .4 .5 1.4 2.5 2.6 3.9 2.1 1.0
1.3 .9 1.4 2.9 1.8 3.3 3.8 1.8 2.8 .9 .0 .5 .7 .5 1.4 1.6 .8 .8 .9 1.6 .4 1.7 1.4
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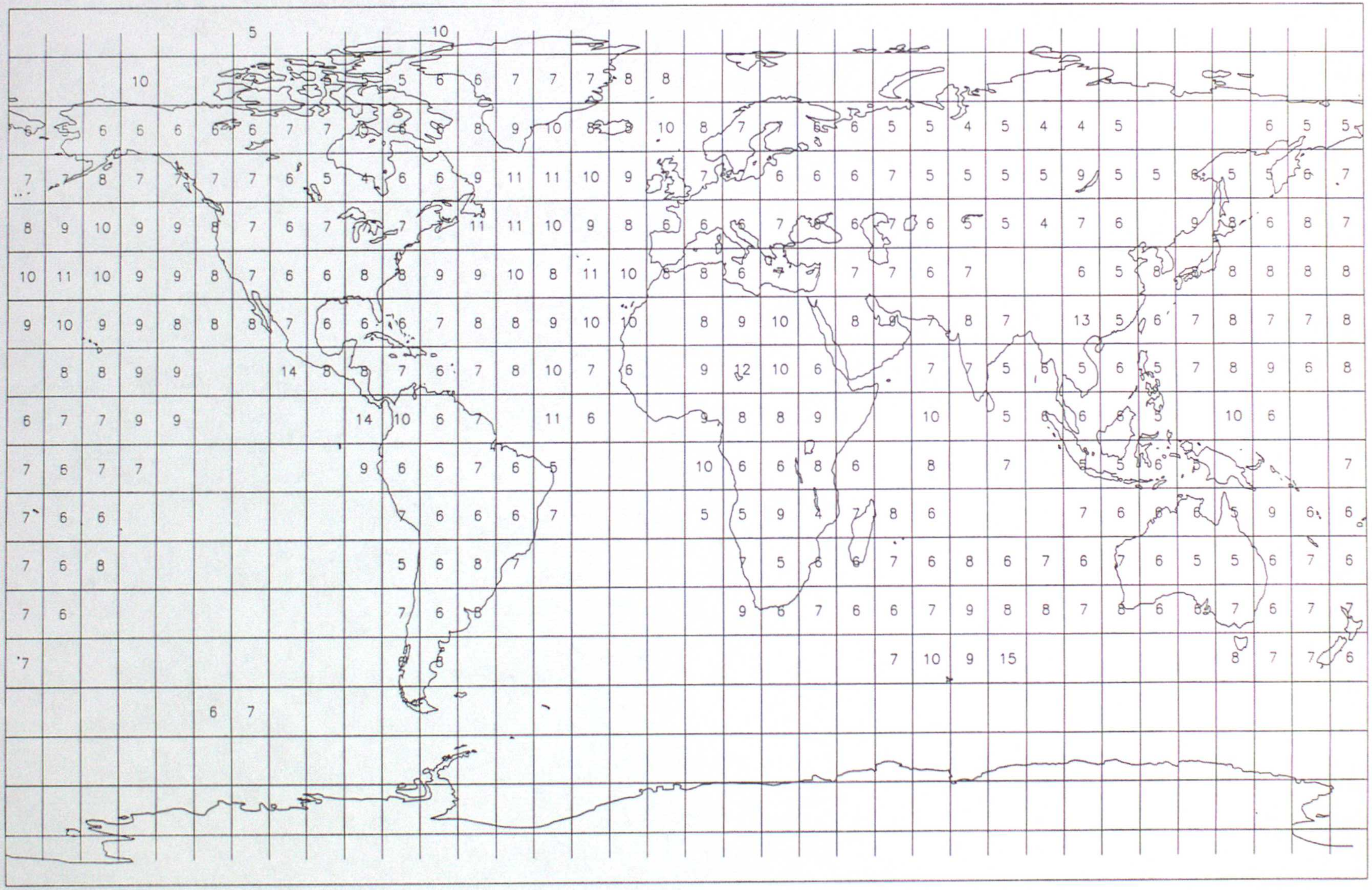
1.6 .6 .2 1.4 2.1 1.5 .2 1.4 .8 .3 -.9 -.4 1.7 1.0 .0 .7 .8 .3 .7 .6 .6 1.0
.4 -1.0 -2.1 1.6 2.5 3.5 3.1 .5 1.3 1.4 .6
.4 -.1

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
JANUARY 2000
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT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8 9 10 9 9 8 7 6 7 7 11 11 10 9 8 6 6 6 7 6 6 7 6 5 5 4 7 6 9 8 6 8 7
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9 10 9 9 8 8 8 7 6 6 6 7 8 8 9 10 10 8 9 10 8 7 8 7 13 5 6 7 8 7 7 8
8 8 9 9 14 8 8 7 6 7 8 10 7 6 9 12 10 6 7 7 5 6 5 6 5 7 8 9 6 8
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7 6 8 5 6 8 7 7 5 6 6 7 6 8 6 7 6 7 6 5 5 6 7 6
7 6 7 6 8 9 6 7 6 6 7 9 8 8 7 8 6 6 7 6 7 7
7 8 7 10 9 15 8 7 7 6
6 7

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
42101	00	Z	250	30/ 76	16	1	79.4	-38.6	88.3	4
42369	00	Z	100	27/ 81	13	0	101.7	-101.9	144.0	5
43003	12	Z	200	19/ 73	21	4	81.0	165.6	184.3	7
43014	12	Z	150	20/ 75	9	1	70.0	81.9	107.8	4
43185	12	Z	100	16/ 81	12	0	76.5	100.1	126.0	4
43192	12	Z	50	15/ 74	10	0	30.1	148.5	151.5	5
43295	12	Z	100	13/ 78	15	0	111.7	64.2	128.8	4
43333	12	Z	200	12/ 93	10	0	84.7	39.1	93.3	4
43369	00	Z	100	8/ 73	24	0	96.0	-95.1	135.1	4
43371	12	Z	100	8/ 77	10	0	83.4	89.3	122.2	5
56739	00	Z	1000	25/ 98	14	15	11.1	82.5	83.2	4
56739	12	Z	1000	25/ 98	30	0	10.3	65.8	66.6	4
60580	12	Z	1000	32/ 5	8	4	5.6	57.5	57.8	5
72376	00	Z	1000	37/-108	27	2	21.4	48.3	52.9	6
72376	12	Z	1000	37/-108	25	3	23.3	41.4	47.6	6
97372	00	Z	150	-10/ 124	13	0	154.1	44.7	160.5	7

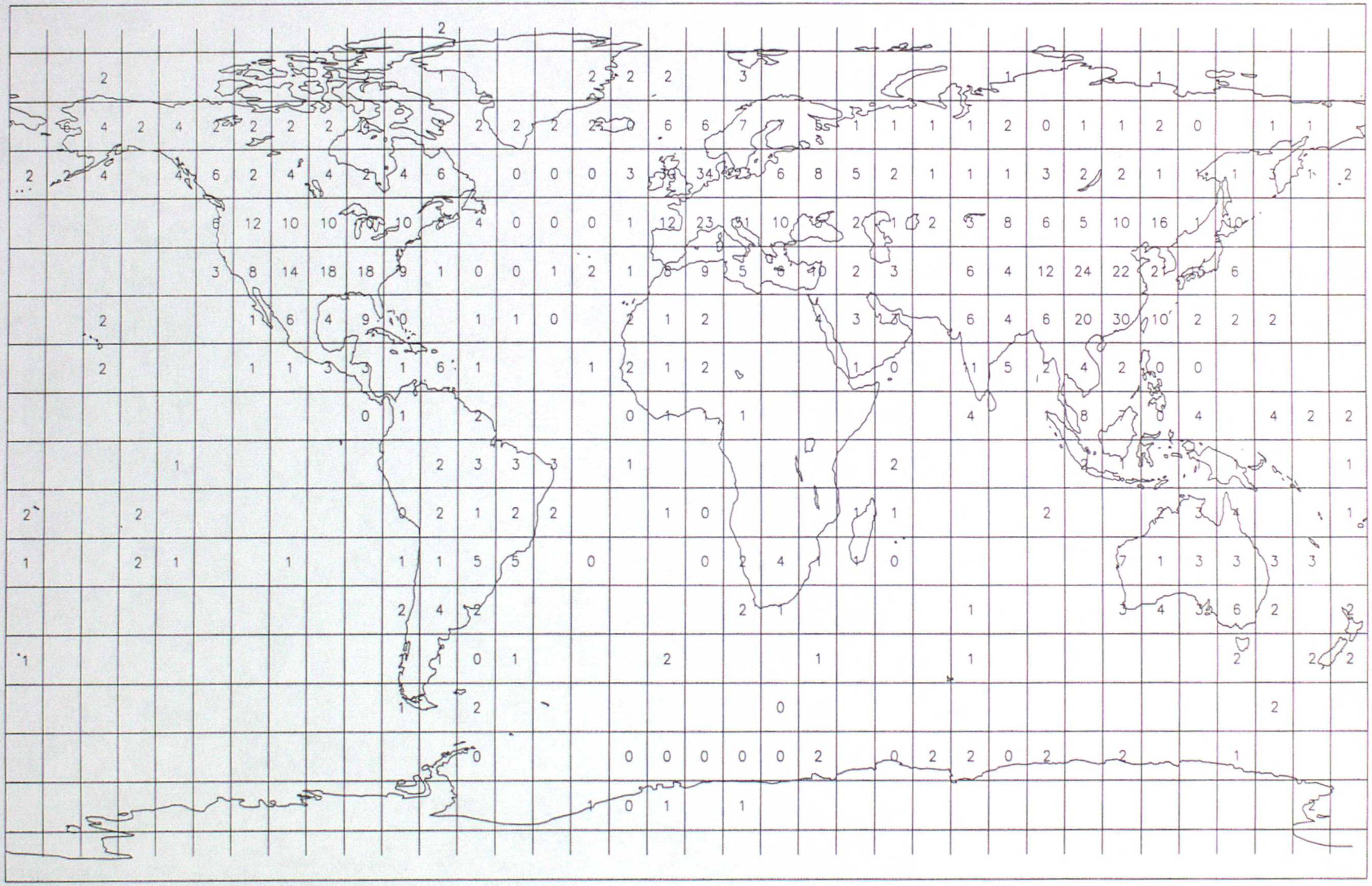
AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – JANUARY 2000

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1082

FIGURE 8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3 8 14 18 18 9 1 0 0 1 2 1 6 9 5 6 10 2 3 6 4 12 24 22 21 6
2 1 6 4 9 10 1 1 0 2 1 2 4 3 3 6 4 6 20 30 10 2 2 2
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0 1 2 0 1 1 4 1 8 7 0 4 4 2 2
1 2 3 3 3 1 2 1
2 2 0 2 1 2 2 1 0 1 1 2 3 4 1
1 2 1 1 1 1 5 5 0 0 2 4 1 1 0 7 1 3 3 3 3
2 4 2 2 1 1 3 4 3 6 2 2
1 1 0 1 2 1 1 2 2 2
1 2 0 2
0 0 0 0 0 0 2 0 2 2 0 2 2 1
1 0 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	100	-5/ -81	5	0	60	-0.9	-7.6	26.9	1
PSPIU	12	V	100	-5/ -81	5	0	40	-6.4	-11.3	27.7	1
17062	12	V	300	41/ 29	20	0	10	-3.7	-0.8	15.4	1
17351	00	V	200	37/ 35	23	0	100	-16.0	4.8	19.9	2
42101	00	V	200	30/ 76	15	0	20	-4.2	0.2	16.2	1
42369	00	V	250	27/ 81	13	0	69	-15.1	6.6	39.2	4
42410	00	V	200	26/ 92	10	0	60	-4.2	-2.2	16.2	2
42410	12	V	300	26/ 92	10	0	90	-18.3	-2.6	26.0	2
48855	00	V	150	16/ 108	30	0	26	3.0	13.0	20.4	1
60571	12	V	100	32/ -2	10	0	20	4.5	-2.4	18.7	1
60620	12	V	250	28/ 0	15	0	73	-33.4	-10.4	39.5	3
60656	12	V	250	28/ -8	17	0	23	-9.2	-7.4	17.7	2
61291	12	V	300	13/ -8	9	0	11	1.6	-0.4	21.2	1
62306	12	V	150	31/ 27	14	1	28	14.5	2.6	23.7	1
68240	00	V	300	-24/ 26	10	0	10	5.8	3.3	16.9	1
68512	12	V	200	-30/ 18	17	0	64	-14.7	5.3	27.9	3
72215	12	V	150	33/ -85	23	0	8	-8.5	-0.6	16.0	1
78486	12	V	100	18/ -70	11	1	36	12.9	-4.8	30.3	2

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – JANUARY 2000

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1211

FIGURE 9

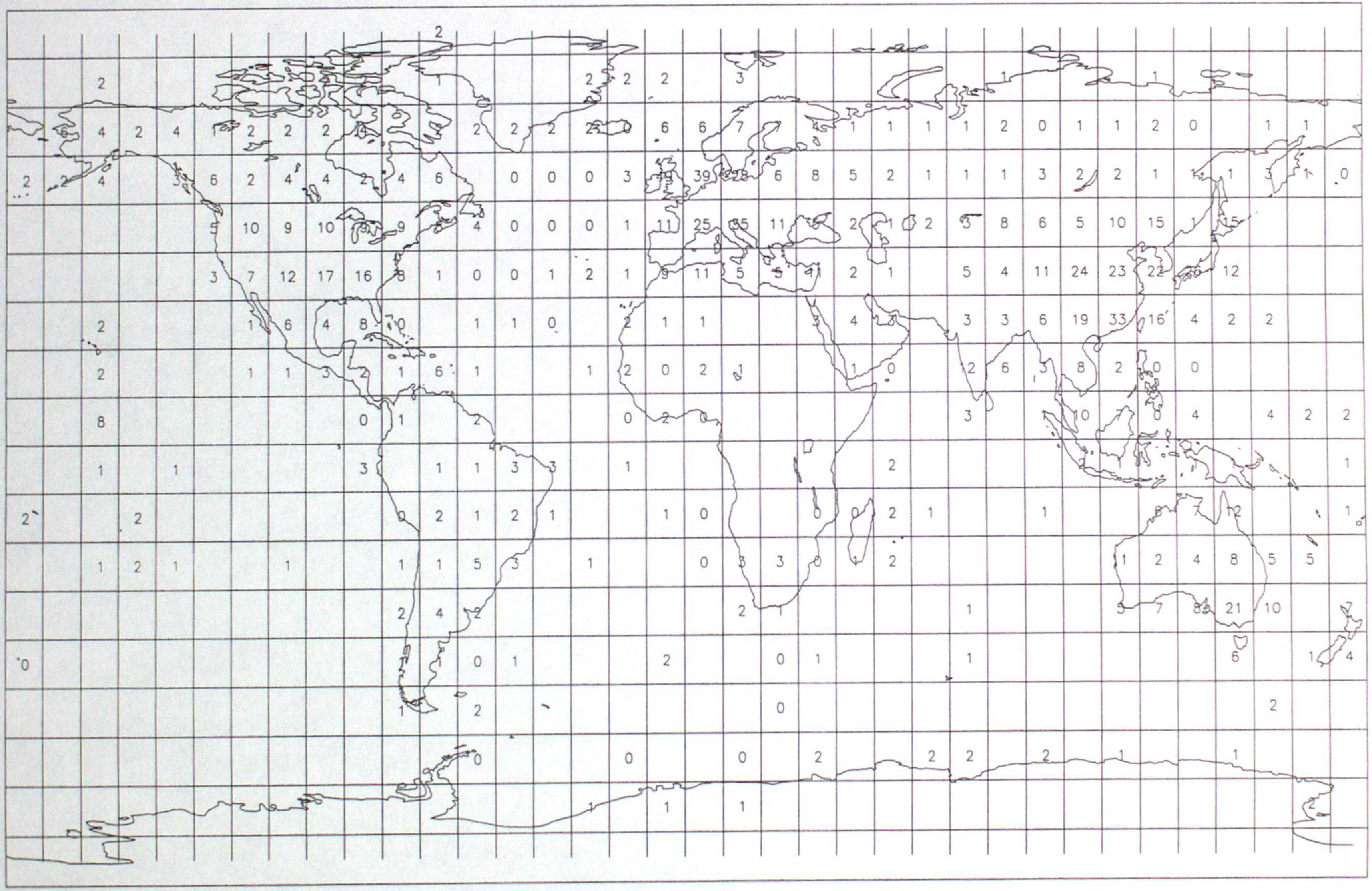

2
2 1 2 2 2 3 1 1
6 4 2 4 1 2 2 2 2 2 2 23 0 6 6 7 45 1 1 1 1 2 0 1 1 2 0 1 1
2 2 4 3 6 2 4 4 2 4 6 0 0 0 3 49 39 28 6 8 5 2 1 1 1 3 2 2 1 1 1 3 1 0
5 10 9 10 9 4 0 0 0 1 11 25 35 11 5 2 1 2 3 8 6 5 10 15 1 15
3 7 12 17 16 8 1 0 0 1 2 1 9 11 5 5 41 2 1 5 4 11 24 23 22 26 12
2 1 6 4 8 0 1 1 0 2 1 1 3 4 3 3 6 19 33 16 4 2 2
2 1 1 3 2 1 6 1 1 2 0 2 1 1 0 12 6 3 8 2 0 0
8 0 1 2 0 2 0 3 1 10 7 0 4 4 2 2
1 1 3 1 1 3 3 1 2 2 1 1 1 1
2 2 0 2 1 2 1 1 0 0 0 2 1 1 8 7 12 1
1 2 1 1 1 1 5 3 1 0 3 3 0 1 2 1 2 4 8 5 5
2 4 2 2 1 1 3 7 83 21 10 7
0 1 0 1 2 0 1 1 6 1 4
1 2 0 2
0 0 0 2 2 2 2 1 1
1 1 1 2

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
08594	12	DD	17/ -23	22	-11.2	3.9	8.6
17240	00	DD	38/ 31	24	-12.5	6.9	12.5
17240	12	DD	38/ 31	13	-12.5	5.5	11.8
17280	00	DD	38/ 40	25	-14.2	3.7	10.6
17351	00	DD	37/ 35	25	-24.3	2.3	12.4
24343	00	DD	67/ 123	7	-11.0	7.3	16.1
43285	00	DD	13/ 75	13	14.2	9.1	26.0
62337	12	DD	31/ 34	26	-15.9	5.3	7.5
67197	12	DD	-25/ 47	9	-10.5	9.8	17.6
96935	00	DD	-7/ 113	7	-19.2	9.7	22.7

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: January 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

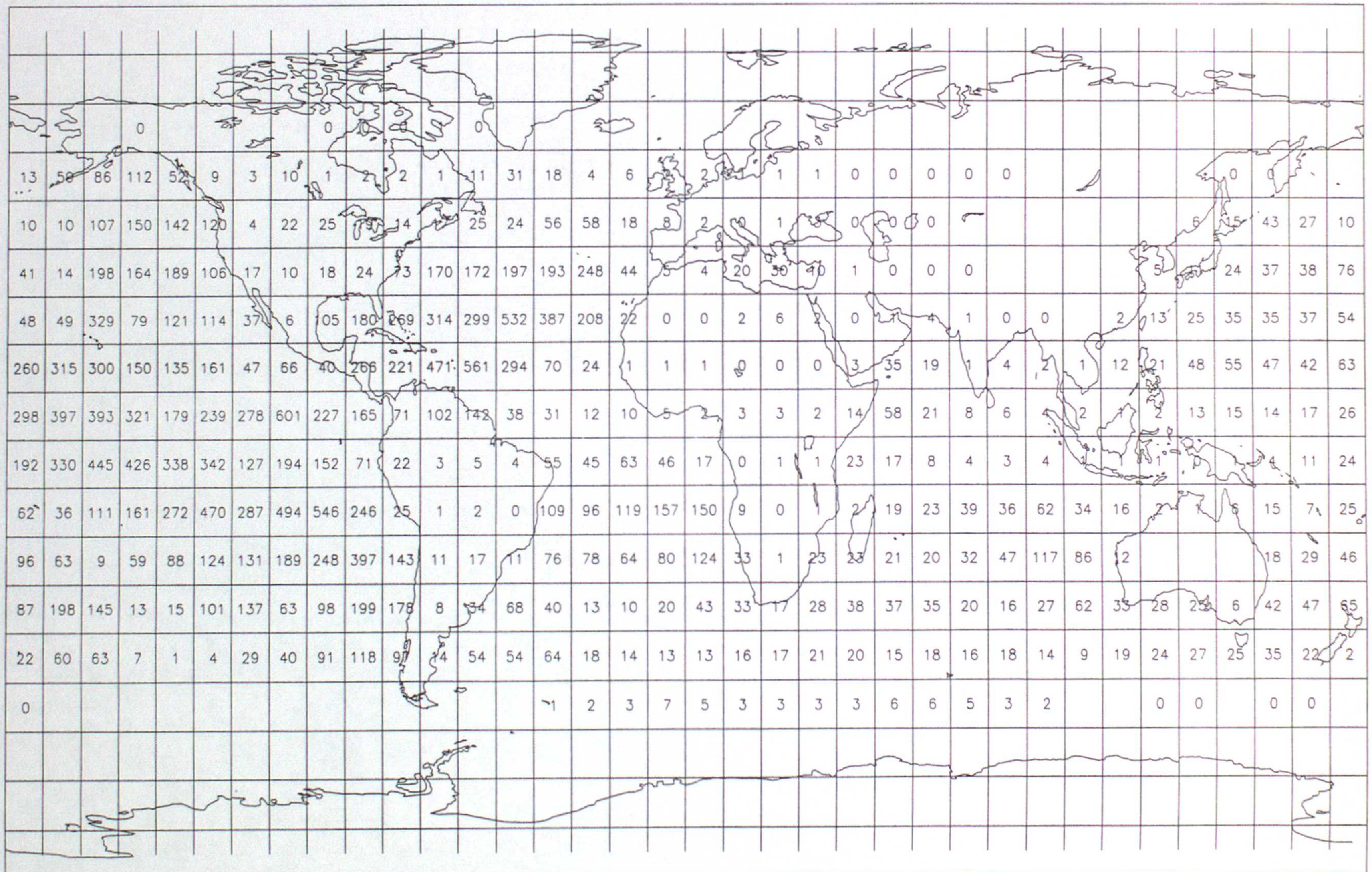
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
JANUARY 2000



			0					0	0	0		0																							
13	58	86	112	52	9	3	10	1	2	2	1	11	31	18	4	6		2		1	1	0	0	0	0	0						0	0		
10	10	107	150	142	120	4	22	25	19	14		25	24	56	58	18	8	2	0	1	3	0	0	0							6	15	43	27	10
41	14	198	164	189	106	17	10	18	24	73	170	172	197	193	248	44	5	4	20	30	40	1	0	0	0					5		24	37	38	76
48	49	329	79	121	114	37	6	105	180	269	314	299	532	387	208	22	0	0	2	6	2	0	1	4	1	0	0		2	13	25	35	35	37	54
260	315	300	150	135	161	47	66	40	266	221	471	561	294	70	24	1	1	1	0	0	0	3	35	19	1	4	2	1	12	21	48	55	47	42	63
298	397	393	321	179	239	278	601	227	165	71	102	142	38	31	12	10	5	2	3	3	2	14	58	21	8	6	4	2	1	2	13	15	14	17	26
192	330	445	426	338	342	127	194	152	71	22	3	5	4	55	45	63	46	17	0	1	1	23	17	8	4	3	4	1	1	1		1	4	11	24
62	36	111	161	272	470	287	494	546	246	25	1	2	0	109	96	119	157	150	9	0	1	2	19	23	39	36	62	34	16	2	1	6	15	7	25
96	63	9	59	88	124	131	189	248	397	143	11	17	11	76	78	64	80	124	33	1	23	23	21	20	32	47	117	86	12				18	29	46
87	198	145	13	15	101	137	63	98	199	178	8	34	68	40	13	10	20	43	33	17	28	38	37	35	20	16	27	62	33	28	25	6	42	47	65
22	60	63	7	1	4	29	40	91	118	97	14	54	54	64	18	14	13	13	16	17	21	20	15	18	16	18	14	9	19	24	27	25	35	22	2
0														1	2	3	7	5	3	3	3	3	6	6	5	3	2			0	0		0	0	

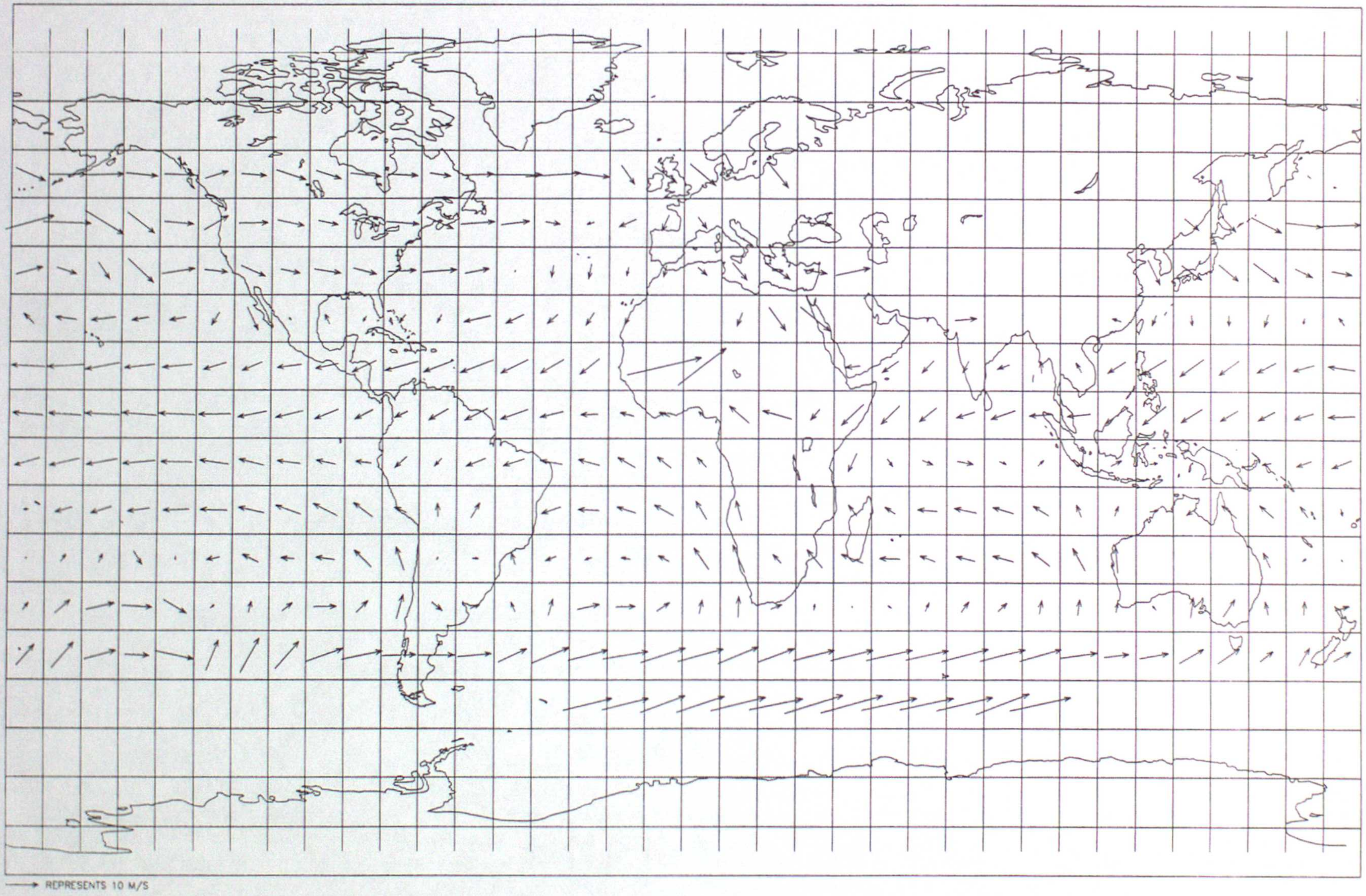
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 701–1000 HPA

JANUARY 2000

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

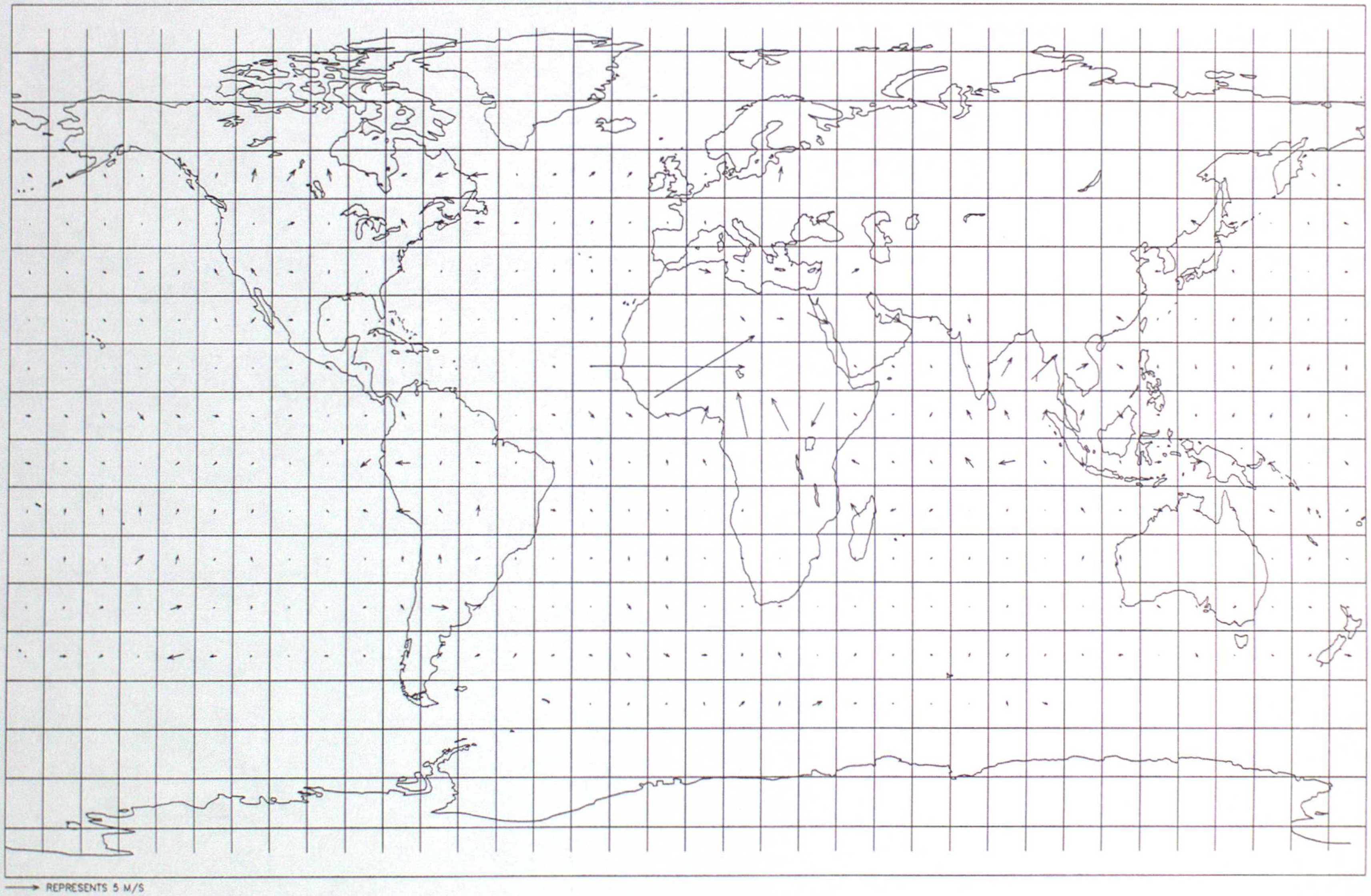
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

FIGURE 12

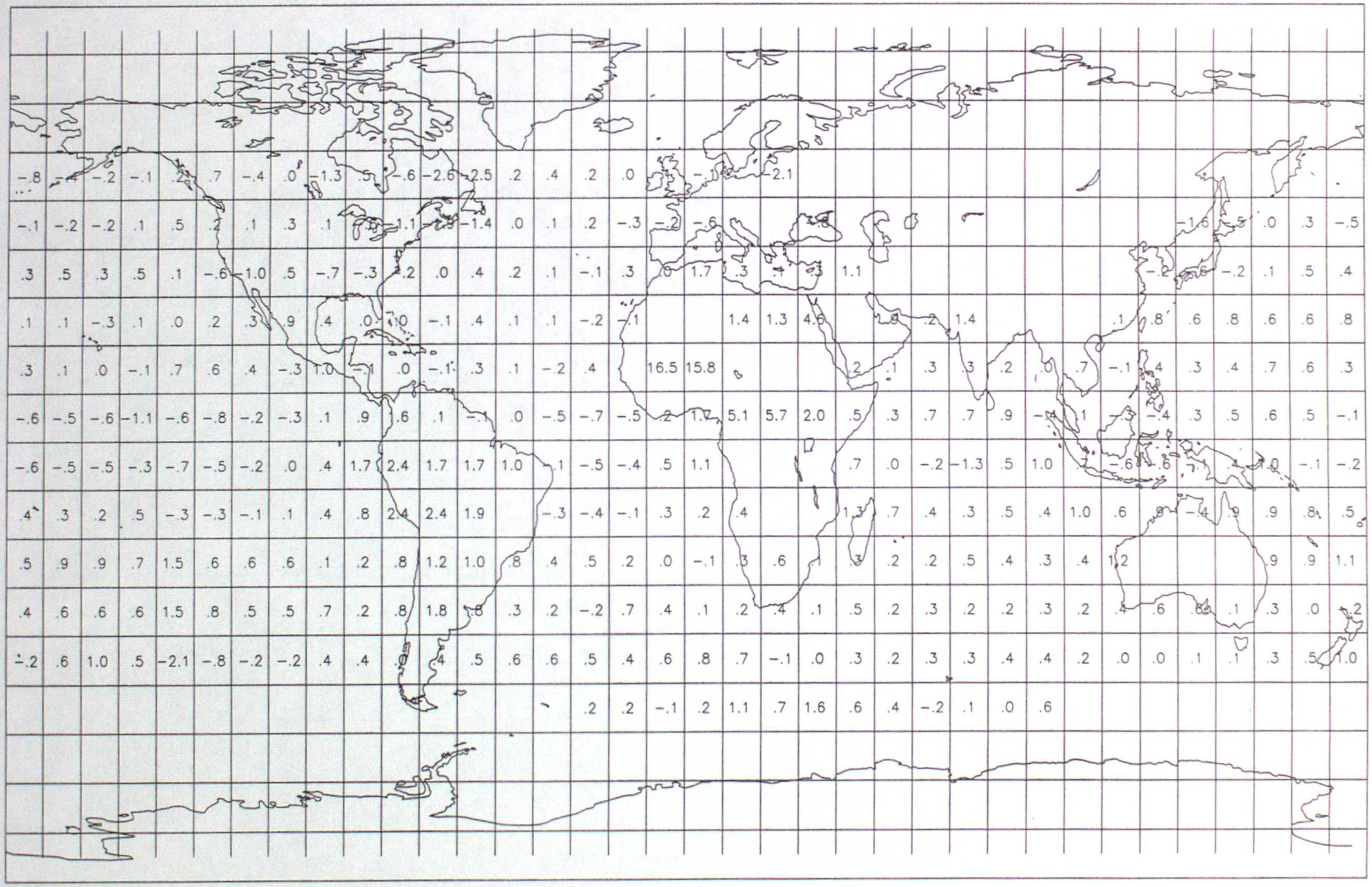
JANUARY 2000

ALL OBSERVATIONS

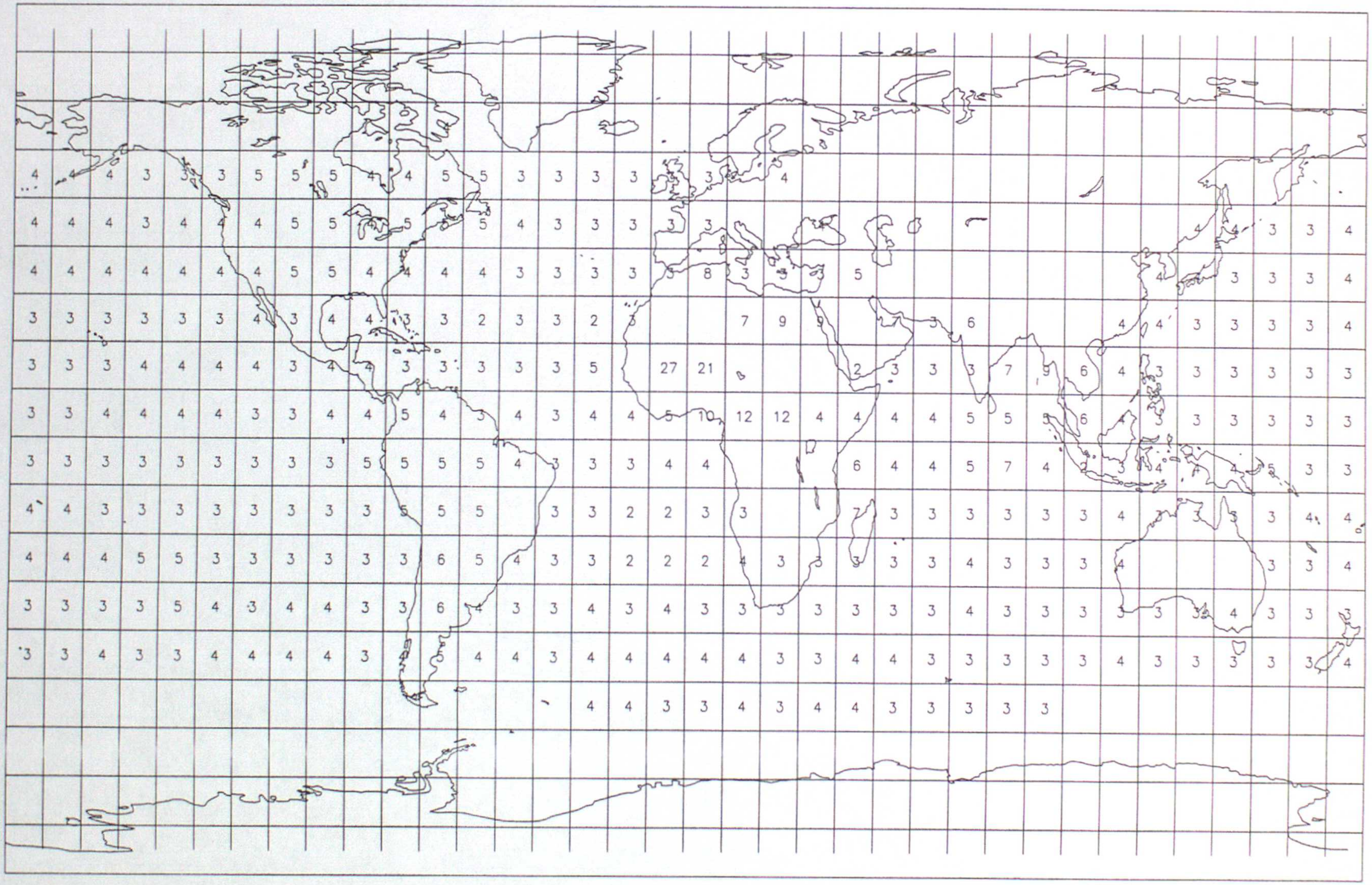
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



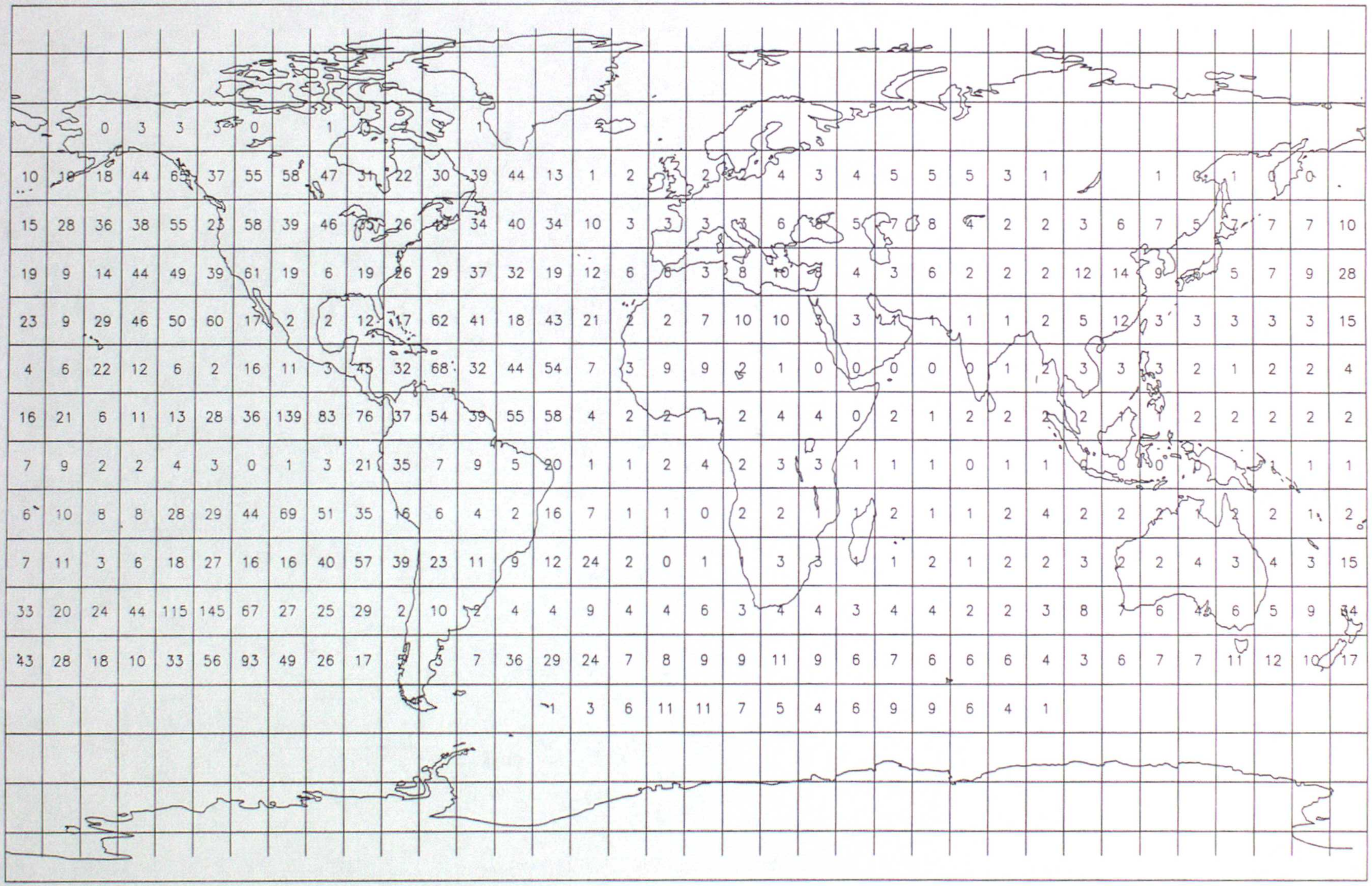
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13.
JANUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-.8 -.4 -.2 -.1 .2 .7 -.4 .0 -1.3 .5 -.6 -2.6 -2.5 .2 .4 .2 .0 -.1 -2.1
-.1 -.2 -.2 .1 .5 .2 .1 .3 .1 -1.1 -1.4 .0 .1 .2 -.3 -.2 -.6 -1.6 -.5 .0 .3 -.5
.3 .5 .3 .5 .1 -.6 -1.0 .5 -.7 -.3 .2 .0 .4 .2 .1 -.1 .3 .0 1.7 .3 .4 .3 1.1 -.2 .6 -.2 .1 .5 .4
.1 .1 -.3 .1 .0 .2 .3 .9 .4 .0 .0 -.1 .4 .1 .1 -.2 -.1 1.4 1.3 4.6 .9 .2 1.4 .1 .8 .6 .8 .6 .6 .8
.3 .1 .0 -.1 .7 .6 .4 -.3 1.0 -.1 .0 -.1 .3 .1 -.2 .4 16.5 15.8 .2 .1 .3 .3 .2 .0 .7 -.1 .4 .3 .4 .7 .6 .3
-.6 -.5 -.6 -1.1 -.6 -.8 -.2 -.3 .1 .9 .6 .1 -.1 .0 -.5 -.7 -.5 .2 1.7 5.1 5.7 2.0 .5 .3 .7 .7 .9 -.4 .1 -.3 -.4 .3 .5 .6 .5 -.1
-.6 -.5 -.5 -.3 -.7 -.5 -.2 .0 .4 1.7 2.4 1.7 1.7 1.0 -.1 -.5 -.4 .5 1.1 .7 .0 -.2 -1.3 .5 1.0 .7 -.6 -.6 .1 .4 1.0 -.1 -.2
.4 .3 .2 .5 -.3 -.3 -.1 .1 .4 .8 2.4 2.4 1.9 -.3 -.4 -.1 .3 .2 .4 1.3 .7 .4 .3 .5 .4 1.0 .6 .9 -.4 .9 .9 .8 .5
.5 .9 .9 .7 1.5 .6 .6 .6 .1 .2 .8 1.2 1.0 .8 .4 .5 .2 .0 -.1 .3 .6 .1 .3 .2 .2 .5 .4 .3 .4 1.2 .9 .9 1.1
.4 .6 .6 .6 1.5 .8 .5 .5 .7 .2 .8 1.8 1.8 .3 .2 -.2 .7 .4 .1 .2 .4 .1 .5 .2 .3 .2 .2 .3 .2 .4 .6 .6 .1 .3 .0 .2
-.2 .6 1.0 .5 -2.1 -.8 -.2 -.2 .4 .4 .0 .4 .5 .6 .6 .5 .4 .6 .8 .7 -.1 .0 .3 .2 .3 .3 .4 .4 .2 .0 .0 .1 .1 .3 .5 1.0
.2 .2 -.1 .2 1.1 .7 1.6 .6 .4 -.2 .1 .0 .6

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
JANUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 4 4 3 3 3 5 5 5 4 4 5 5 3 3 3 3 3 4
4 4 4 3 4 4 4 5 5 5 5 4 3 3 3 3 3 4 4 3 3 4
4 4 4 4 4 4 4 5 5 4 4 4 4 3 3 3 3 3 8 3 3 3 5 4 3 3 3 4
3 3 3 3 3 3 4 3 4 4 3 3 2 3 3 2 3 7 9 9 7 3 6 4 4 3 3 3 3 4
3 3 3 4 4 4 4 3 4 4 3 3 3 3 3 5 27 21 2 3 3 3 7 9 6 4 3 3 3 3 3 3
3 3 4 4 4 4 3 3 4 4 5 4 3 4 3 4 4 5 10 12 12 4 4 4 4 5 5 5 6 4 3 3 3 3 3
3 3 3 3 3 3 3 3 3 5 5 5 5 4 3 3 3 4 4 6 4 4 5 7 4 3 4 4 5 3 3
4 4 3 3 3 3 3 3 3 3 5 5 5 3 3 2 2 3 3 7 3 3 3 3 3 3 4 3 3 3 4 4
4 4 4 5 5 3 3 3 3 3 3 6 5 4 3 3 2 2 2 4 3 3 3 3 3 4 3 3 3 4 3 3 4
3 3 3 3 5 4 3 4 4 3 3 6 4 3 3 4 3 4 3 3 3 3 3 3 3 4 3 3 3 3 3 3 4 3 3 3
3 3 4 3 3 4 4 4 4 3 5 4 4 3 4 4 4 4 4 3 3 4 4 3 3 3 3 3 4 3 3 3 3 3 4
4 4 3 3 4 3 4 4 3 3 3 3 3

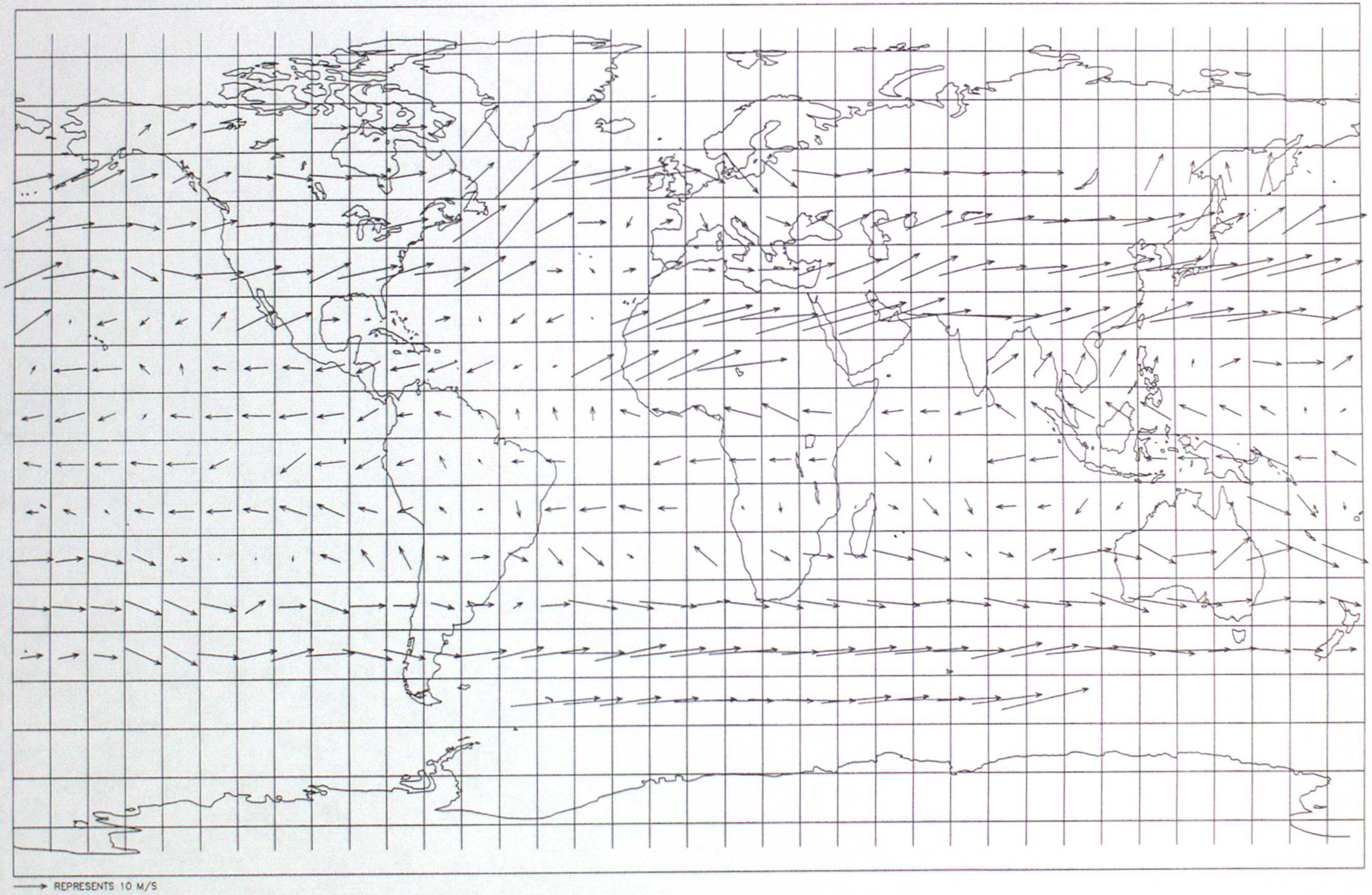
AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
JANUARY 2000



		0	3	3	3	0		1				1																							
10	10	18	44	65	37	55	58	47	31	22	30	39	44	13	1	2		2	2	4	3	4	5	5	5	3	1			1	0	1	0	0	
15	28	36	38	55	23	58	39	46	35	26	[illegible]	34	40	34	10	3	3	3	3	6	8	5	7	8	4	2	2	3	6	7	5	7	7	7	10
19	9	14	44	49	39	61	19	6	19	26	29	37	32	19	12	6	8	3	8	10	8	4	3	6	2	2	2	12	14	9	6	5	7	9	28
23	9	29	46	50	60	17	2	2	12	17	62	41	18	43	21	2	2	7	10	10	3	3	1	1	1	1	2	5	12	3	3	3	3	3	15
4	6	22	12	6	2	16	11	3	45	32	68	32	44	54	7	3	9	9	2	1	0	0	0	0	0	1	2	3	3	3	2	1	2	2	4
16	21	6	11	13	28	36	139	83	76	37	54	39	55	58	4	2	2	1	2	4	4	0	2	1	2	2	2	2	1	1	2	2	2	2	2
7	9	2	2	4	3	0	1	3	21	35	7	9	5	20	1	1	2	4	2	3	3	1	1	1	0	1	1	0	0	0	0	1	1	1	1
6	10	8	8	28	29	44	69	51	35	16	6	4	2	16	7	1	1	0	2	2	1	1	2	1	1	2	4	2	2	2	1	2	2	1	2
7	11	3	6	18	27	16	16	40	57	39	23	11	9	12	24	2	0	1	1	3	3	1	1	2	1	2	2	3	2	2	4	3	4	3	15
33	20	24	44	115	145	67	27	25	29	2	10	2	4	4	9	4	4	6	3	4	4	3	4	4	2	2	3	8	7	6	4	6	5	9	34
43	28	18	10	33	56	93	49	26	17	5	3	7	36	29	24	7	8	9	9	11	9	6	7	6	6	6	4	3	6	7	7	11	12	10	17
														1	3	6	11	11	7	5	4	6	9	9	6	4	1								

SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA
JANUARY 2000
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16


→ REPRESENTS 10 M/S

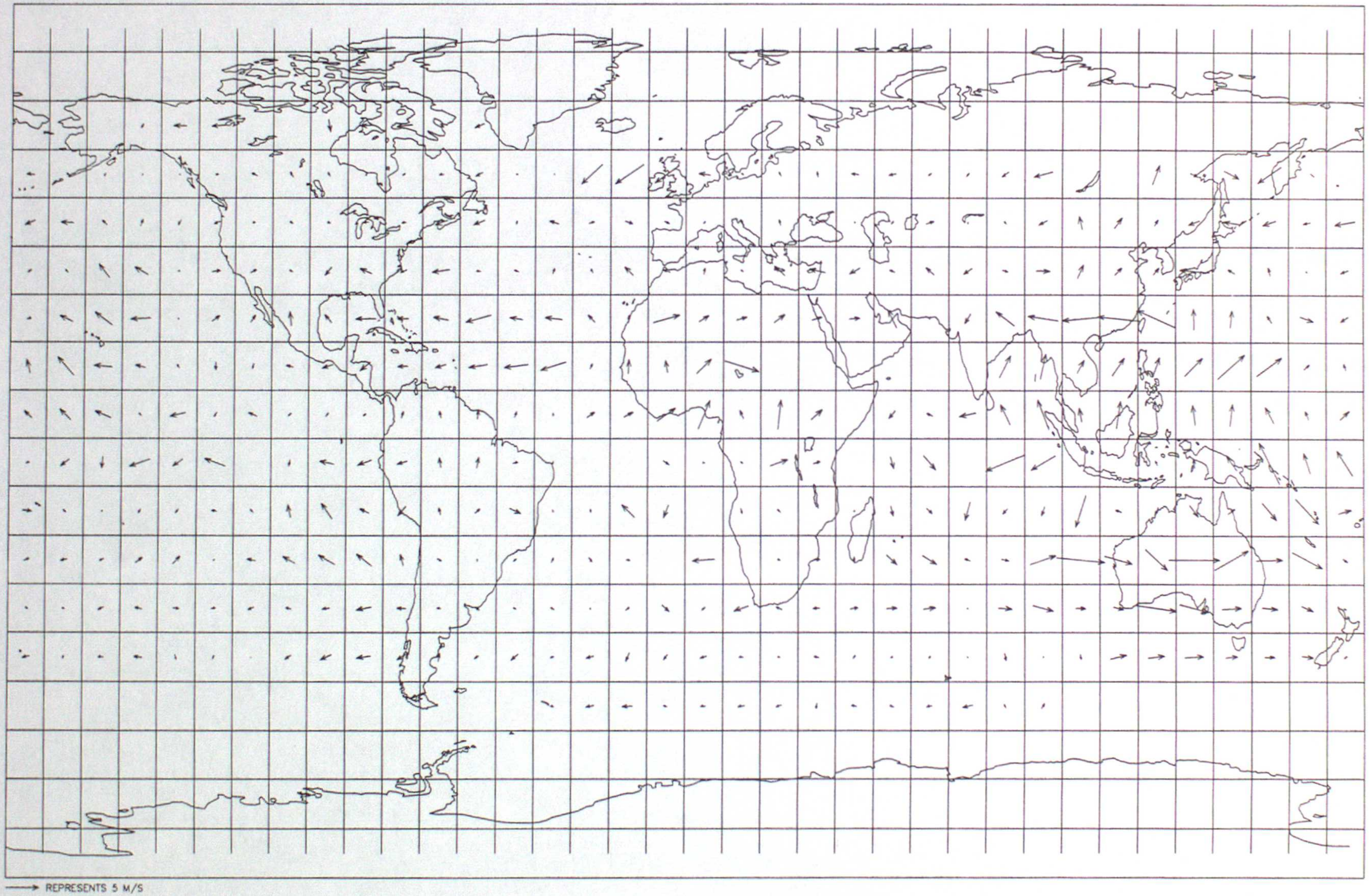
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA

JANUARY 2000

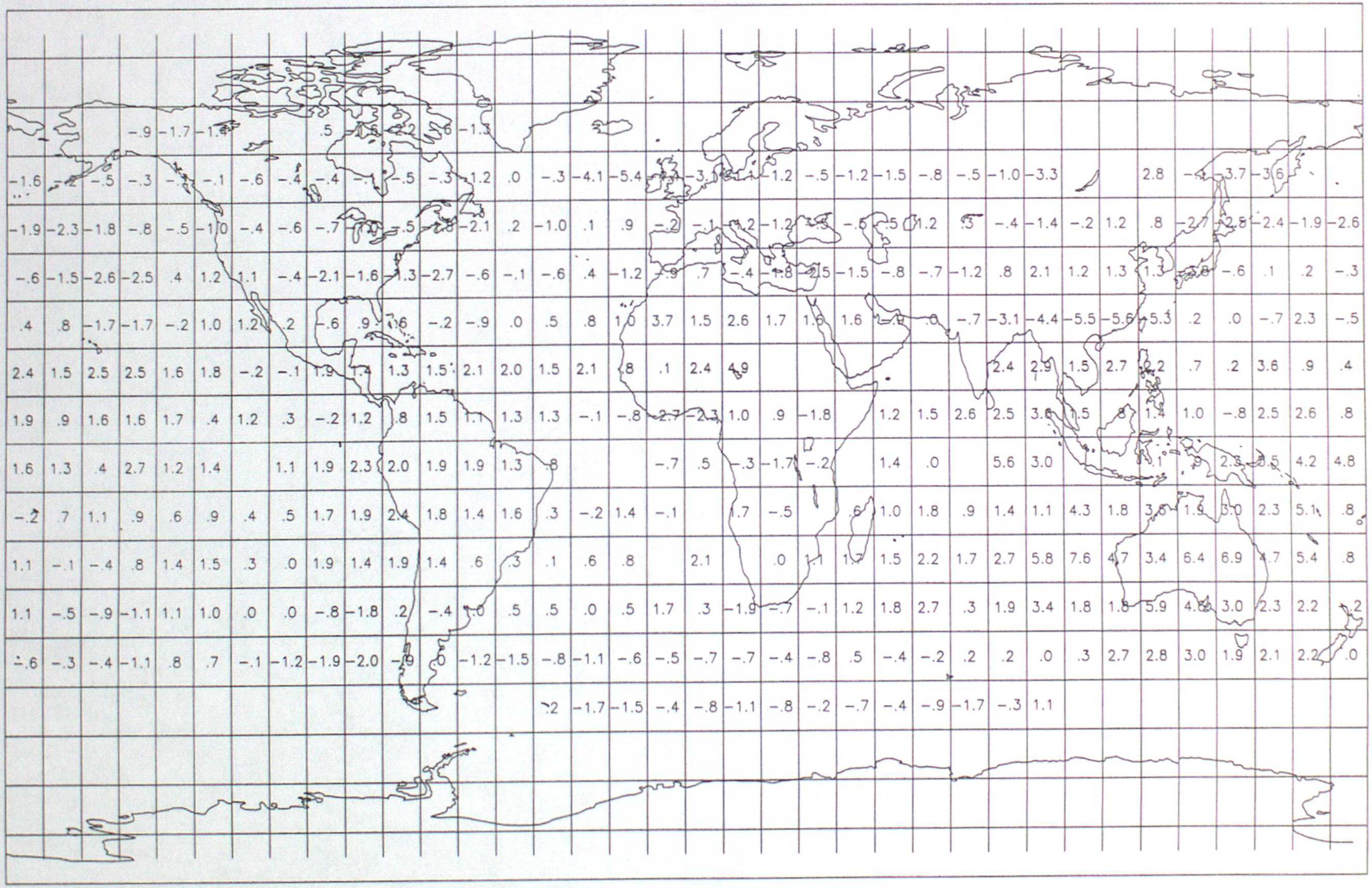
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

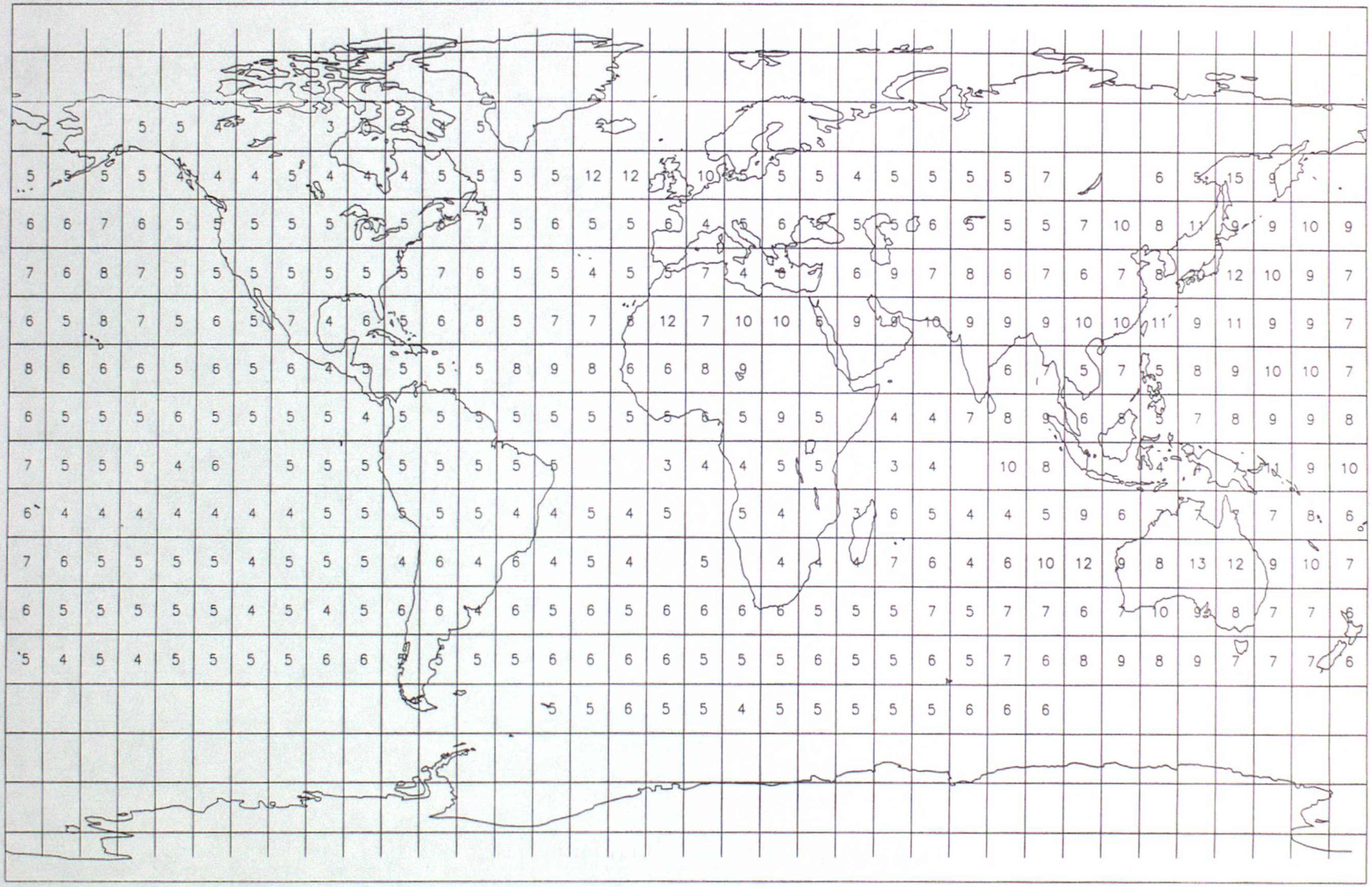
FIGURE 17



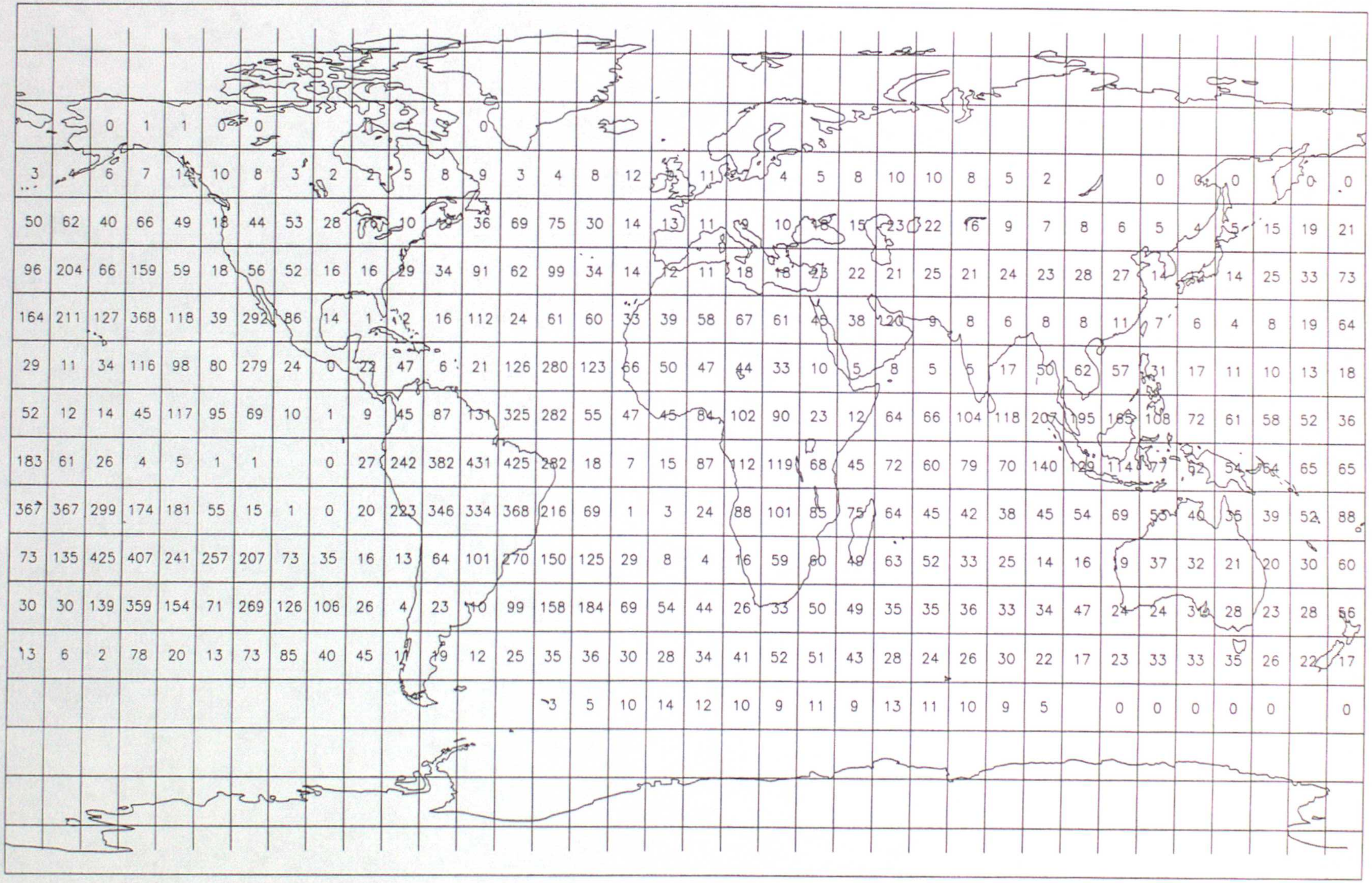
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
JANUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
JANUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
JANUARY 2000



		0	1	1	0	0						0																							
3	4	6	7	14	10	8	3	2	2	5	8	9	3	4	8	12	9	11	7	4	5	8	10	10	8	5	2			0	0	0		0	0
50	62	40	66	49	18	44	53	28	10	10	18	36	69	75	30	14	13	11	9	10	18	15	23	22	16	9	7	8	6	5	4	5	15	19	21
96	204	66	159	59	18	56	52	16	16	29	34	91	62	99	34	14	12	11	18	18	23	22	21	25	21	24	23	28	27	14	12	14	25	33	73
164	211	127	368	118	39	292	86	14	1	2	16	112	24	61	60	33	39	58	67	61	45	38	120	9	8	6	8	8	11	7	6	4	8	19	64
29	11	34	116	98	80	279	24	0	22	47	6	21	126	280	123	66	50	47	44	33	10	5	8	5	5	17	50	62	57	31	17	11	10	13	18
52	12	14	45	117	95	69	10	1	9	45	87	131	325	282	55	47	45	84	102	90	23	12	64	66	104	118	207	195	165	108	72	61	58	52	36
183	61	26	4	5	1	1		0	27	242	382	431	425	282	18	7	15	87	112	119	68	45	72	60	79	70	140	129	114	77	62	54	64	65	65
367	367	299	174	181	55	15	1	0	20	223	346	334	368	216	69	1	3	24	88	101	85	75	64	45	42	38	45	54	69	53	40	35	39	52	88
73	135	425	407	241	257	207	73	35	16	13	64	101	270	150	125	29	8	4	16	59	60	48	63	52	33	25	14	16	19	37	32	21	20	30	60
30	30	139	359	154	71	269	126	106	26	4	23	110	99	158	184	69	54	44	26	33	50	49	35	35	36	33	34	47	24	24	31	28	23	28	56
13	6	2	78	20	13	73	85	40	45	11	19	12	25	35	36	30	28	34	41	52	51	43	28	24	26	30	22	17	23	33	33	35	26	22	17
														3	5	10	14	12	10	9	11	9	13	11	10	9	5		0	0	0	0	0		0

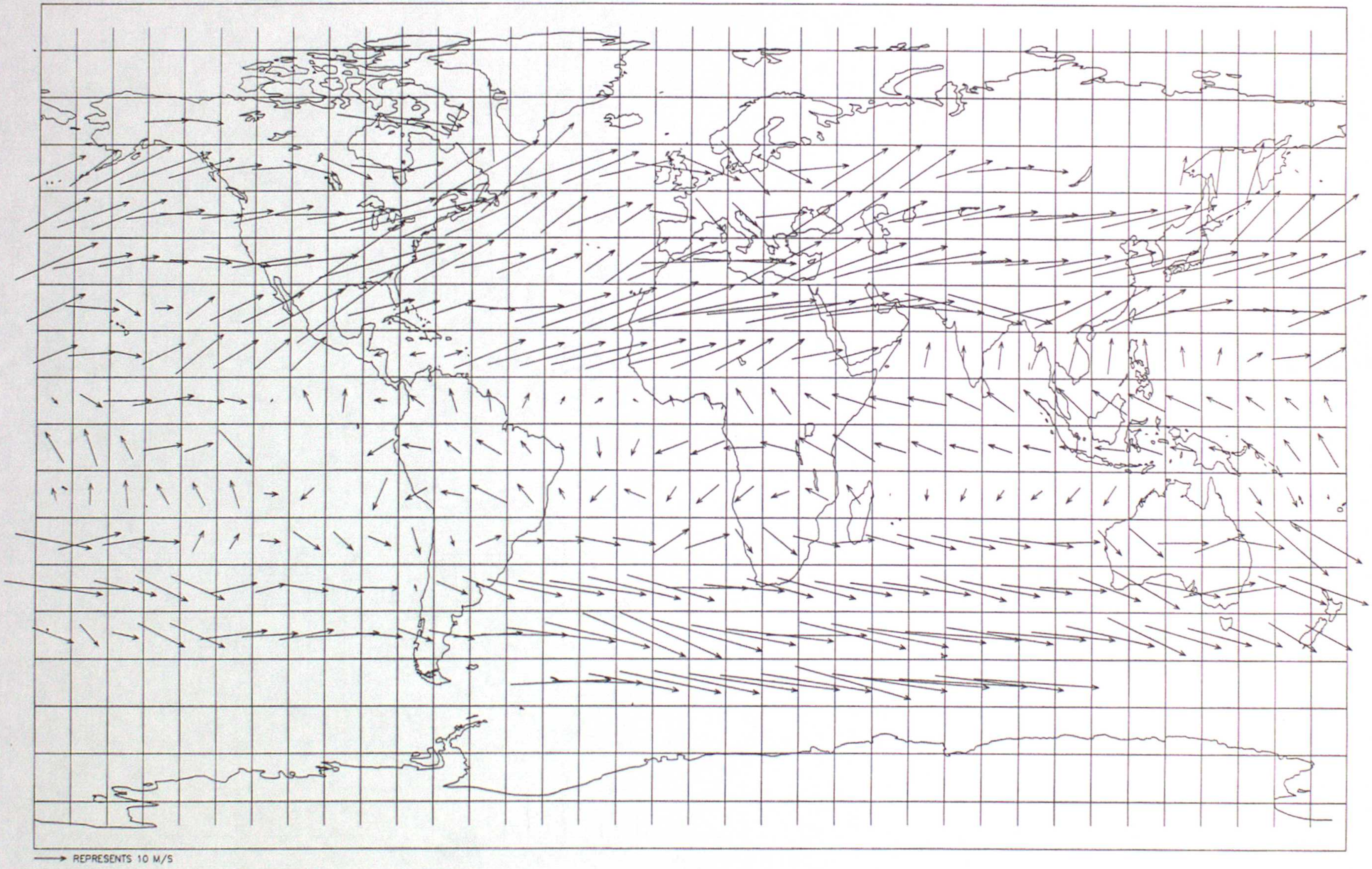
SATOB METEOSAT W/V VECTOR MEAN WINDS BETWEEN 101–400 HPA

FIGURE 21

JANUARY 2000

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

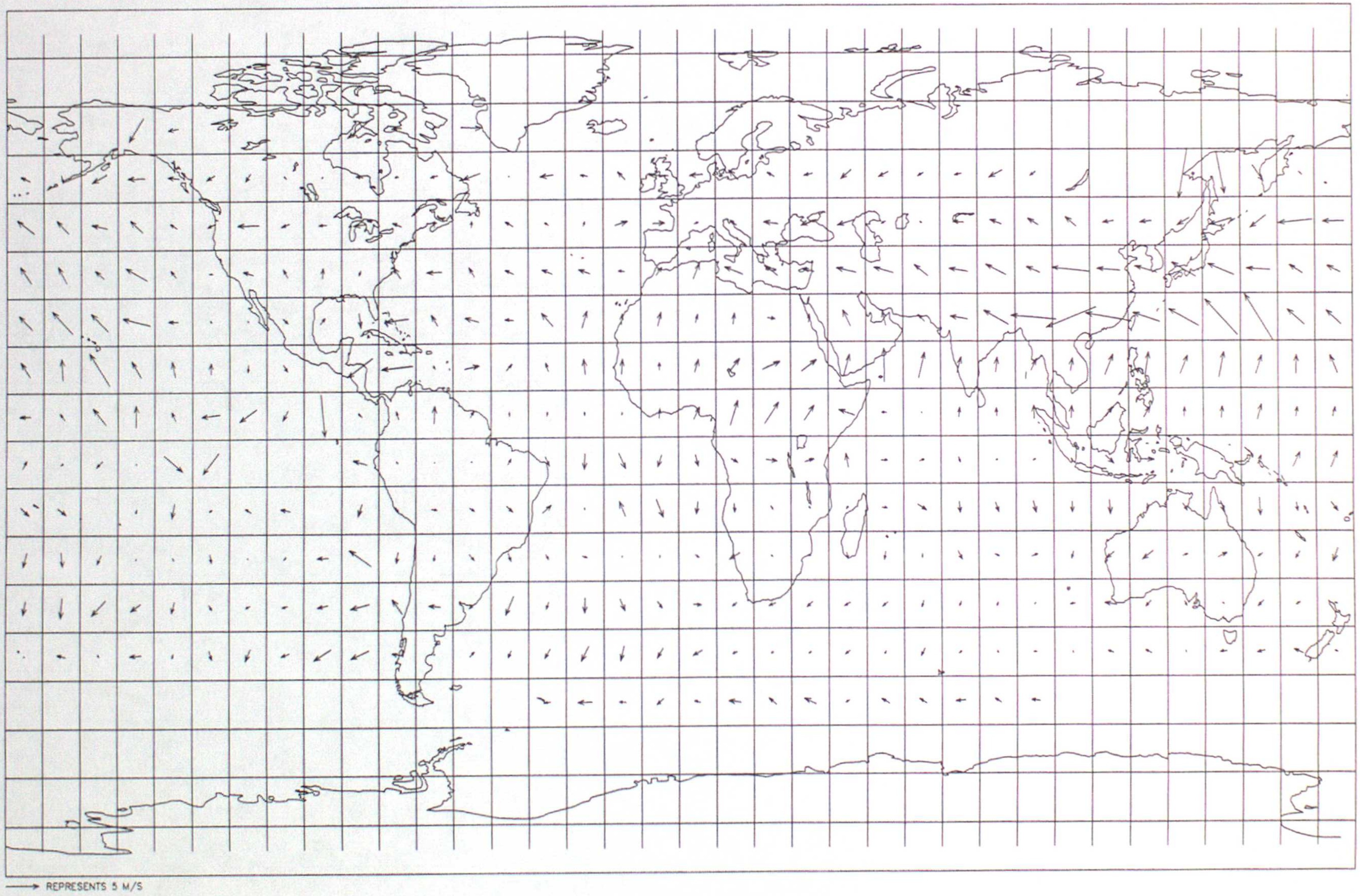
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

FIGURE 22

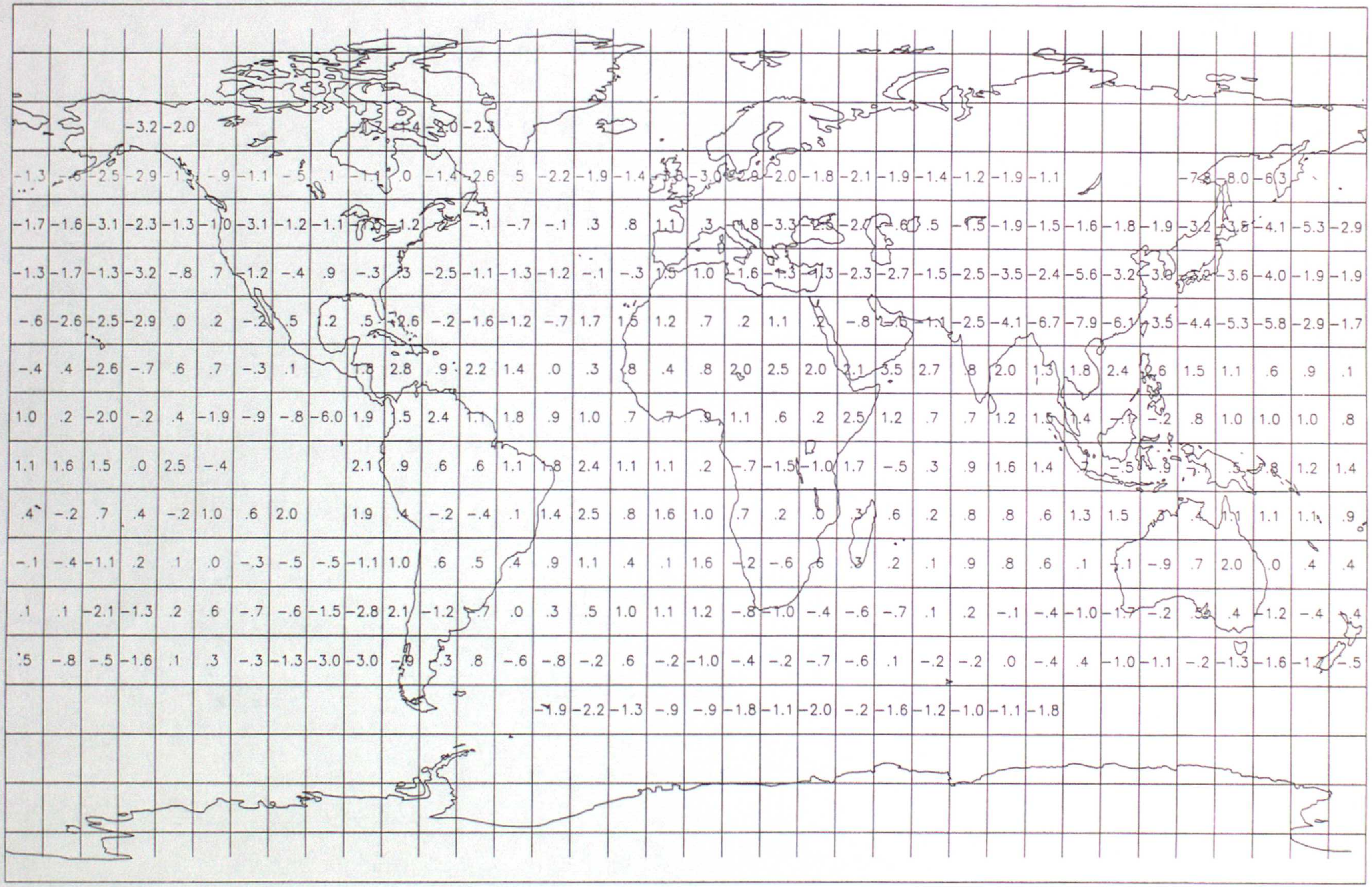
JANUARY 2000

ALL OBSERVATIONS

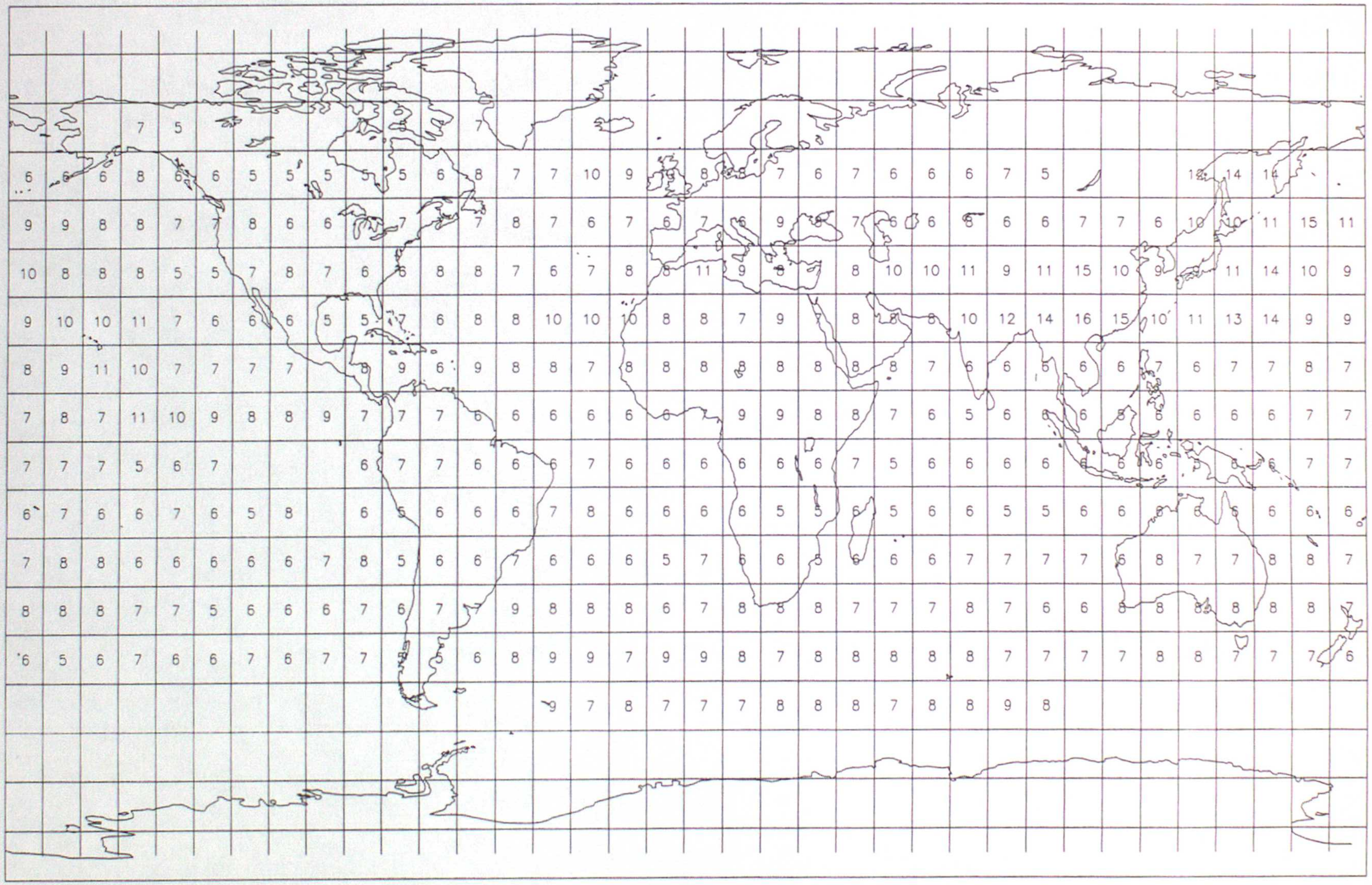
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
JANUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-3.2 -2.0 -1.7 -1.4 -2.0 -2.3
-1.3 -.6 -2.5 -2.9 -1.1 -.9 -1.1 -.5 .1 -1.1 .0 -1.4 -2.6 .5 -2.2 -1.9 -1.4 -3.6 -3.0 -2.9 -2.0 -1.8 -2.1 -1.9 -1.4 -1.2 -1.9 -1.1 -7.8 -8.0 -6.3
-1.7 -1.6 -3.1 -2.3 -1.3 -1.0 -3.1 -1.2 -1.1 -1.5 -1.2 .2 -.1 -.7 -.1 .3 .8 1.1 .3 -1.8 -3.3 -2.5 -2.0 -.6 .5 -1.5 -1.9 -1.5 -1.6 -1.8 -1.9 -3.2 -3.8 -4.1 -5.3 -2.9
-1.3 -1.7 -1.3 -3.2 -.8 .7 -1.2 -.4 .9 -.3 .3 -2.5 -1.1 -1.3 -1.2 -.1 -.3 1.5 1.0 -1.6 -1.3 -1.3 -2.3 -2.7 -1.5 -2.5 -3.5 -2.4 -5.6 -3.2 -3.0 -3.2 -3.6 -4.0 -1.9 -1.9
-.6 -2.6 -2.5 -2.9 .0 .2 -.2 .5 1.2 .5 -2.6 -.2 -1.6 -1.2 -.7 1.7 1.5 1.2 .7 .2 1.1 .2 -.8 -.5 -1.1 -2.5 -4.1 -6.7 -7.9 -6.1 -3.5 -4.4 -5.3 -5.8 -2.9 -1.7
-.4 .4 -2.6 -.7 .6 .7 -.3 .1 1.8 2.8 .9 2.2 1.4 .0 .3 .8 .4 .8 2.0 2.5 2.0 2.1 3.5 2.7 .8 2.0 1.3 1.8 2.4 2.6 1.5 1.1 .6 .9 .1
1.0 .2 -2.0 -.2 .4 -1.9 -.9 -.8 -6.0 1.9 1.5 2.4 1.1 1.8 .9 1.0 .7 .7 .9 1.1 .6 .2 2.5 1.2 .7 .7 1.2 1.5 1.4 -.1 -.2 .8 1.0 1.0 1.0 .8
1.1 1.6 1.5 .0 2.5 -.4 2.1 .9 .6 .6 1.1 1.8 2.4 1.1 1.1 .2 -.7 -1.5 -1.0 1.7 -.5 .3 .9 1.6 1.4 .7 -.5 .9 .7 .5 .8 1.2 1.4
.4 -.2 .7 .4 -.2 1.0 .6 2.0 1.9 .4 -.2 -.4 .1 1.4 2.5 .8 1.6 1.0 .7 .2 .0 .3 .6 .2 .8 .8 .6 1.3 1.5 .3 .4 1.1 1.1 1.1 .9
-.1 -.4 -1.1 .2 .1 .0 -.3 -.5 -.5 -1.1 1.0 .6 .5 .4 .9 1.1 .4 .1 1.6 -.2 -.6 .6 .3 .2 .1 .9 .8 .6 .1 .1 -.9 .7 2.0 .0 .4 .4
.1 .1 -2.1 -1.3 .2 .6 -.7 -.6 -1.5 -2.8 2.1 -1.2 -.7 .0 .3 .5 1.0 1.1 1.2 -.8 -1.0 -.4 -.6 -.7 .1 .2 -.1 -.4 -1.0 -1.7 -.2 .5 .4 -1.2 -.4 .4
.5 -.8 -.5 -1.6 .1 .3 -.3 -1.3 -3.0 -3.0 -.9 .3 .8 -.6 -.8 -.2 .6 -.2 -1.0 -.4 -.2 -.7 -.6 .1 -.2 -.2 .0 -.4 .4 -1.0 -1.1 -.2 -1.3 -1.6 -1.7 -.5
-1.9 -2.2 -1.3 -.9 -.9 -1.8 -1.1 -2.0 -.2 -1.6 -1.2 -1.0 -1.1 -1.8

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
JANUARY 2000
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

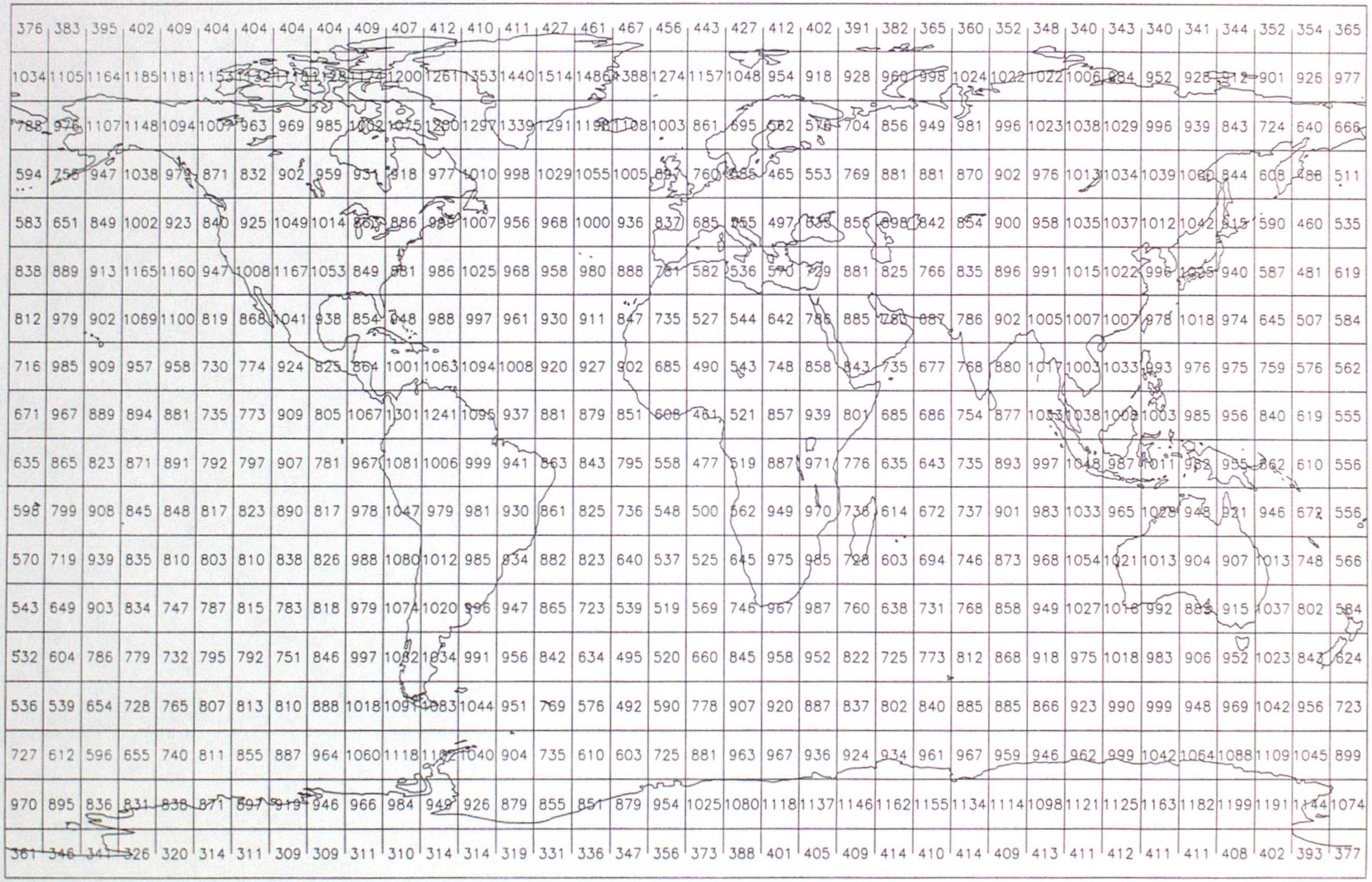
MONTH: January 2000

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from NOAA-15.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100)
	:Mean and standard deviation observation-minus-background brightness temperature differences

ATOVS : MEAN DAILY NUMBER OF OBSERVATIONS
JANUARY 2000
NOAA-15, USING ALL OBSERVATIONS

FIGURE 25

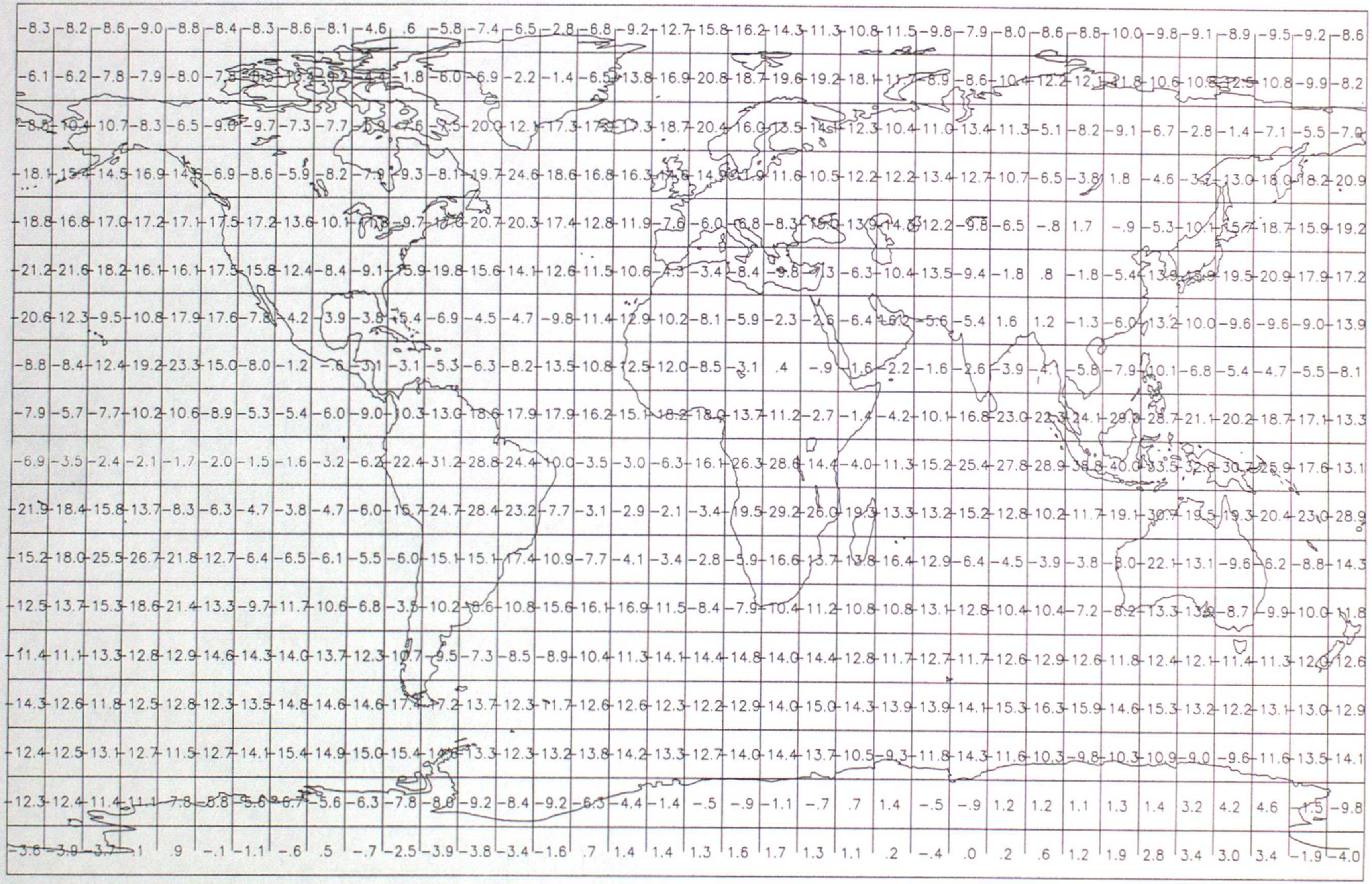


376	383	395	402	409	404	404	404	404	409	407	412	410	411	427	461	467	456	443	427	412	402	391	382	365	360	352	348	340	343	340	341	344	352	354	365
1034	1105	1164	1185	1181	1153	1132	1118	1128	1174	1200	1261	1353	1440	1514	1486	1388	1274	1157	1048	954	918	928	960	998	1024	1022	1022	1006	984	952	928	912	901	926	977
788	976	1107	1148	1094	1007	963	969	985	1002	1075	1200	1297	1339	1291	1198	1108	1003	861	695	582	576	704	856	949	981	996	1023	1038	1029	996	939	843	724	640	666
594	755	947	1038	979	871	832	902	959	931	918	977	1010	998	1029	1055	1005	837	760	585	465	553	769	881	881	870	902	976	1013	1034	1039	1060	844	608	488	511
583	651	849	1002	923	840	925	1049	1014	863	886	989	1007	956	968	1000	936	837	685	855	497	635	856	898	842	854	900	958	1035	1037	1012	1042	815	590	460	535
838	889	913	1165	1160	947	1008	1167	1053	849	881	986	1025	968	958	980	888	781	582	536	570	729	881	825	766	835	896	991	1015	1022	996	1025	940	587	481	619
812	979	902	1069	1100	819	868	1041	938	854	948	988	997	961	930	911	847	735	527	544	642	786	885	783	687	786	902	1005	1007	1007	978	1018	974	645	507	584
716	985	909	957	958	730	774	924	825	864	1001	1063	1094	1008	920	927	902	685	490	543	748	858	843	735	677	768	880	1017	1003	1033	993	976	975	759	576	562
671	967	889	894	881	735	773	909	805	1067	1301	1241	1095	937	881	879	851	608	461	521	857	939	801	685	686	754	877	1053	1038	1008	1003	985	956	840	619	555
635	865	823	871	891	792	797	907	781	967	1081	1006	999	941	863	843	795	558	477	519	887	971	776	635	643	735	893	997	1048	987	1011	982	955	862	610	556
598	799	908	845	848	817	823	890	817	978	1047	979	981	930	861	825	736	548	500	562	949	970	736	614	672	737	901	983	1033	965	1028	948	921	946	672	556
570	719	939	835	810	803	810	838	826	988	1080	1012	985	834	882	823	640	537	525	645	975	985	728	603	694	746	873	968	1054	1021	1013	904	907	1013	748	566
543	649	903	834	747	787	815	783	818	979	1074	1020	996	947	865	723	539	519	569	746	967	987	760	638	731	768	858	949	1027	1018	992	883	915	1037	802	584
532	604	786	779	732	795	792	751	846	997	1082	1034	991	956	842	634	495	520	660	845	958	952	822	725	773	812	868	918	975	1018	983	906	952	1023	843	624
536	539	654	728	765	807	813	810	888	1018	1091	1083	1044	951	769	576	492	590	778	907	920	887	837	802	840	885	885	866	923	990	999	948	969	1042	956	723
727	612	596	655	740	811	855	887	964	1060	1118	1162	1040	904	735	610	603	725	881	963	967	936	924	934	961	967	959	946	962	999	1042	1064	1088	1109	1045	899
970	895	836	831	838	871	897	919	946	966	984	949	926	879	855	851	879	954	1025	1080	1118	1137	1146	1162	1155	1134	1114	1098	1121	1125	1163	1182	1199	1191	1144	1074
361	346	341	326	320	314	311	309	309	311	310	314	314	319	331	336	347	356	373	388	401	405	409	414	410	414	409	413	411	412	411	411	408	402	393	377

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)

FIGURE 26

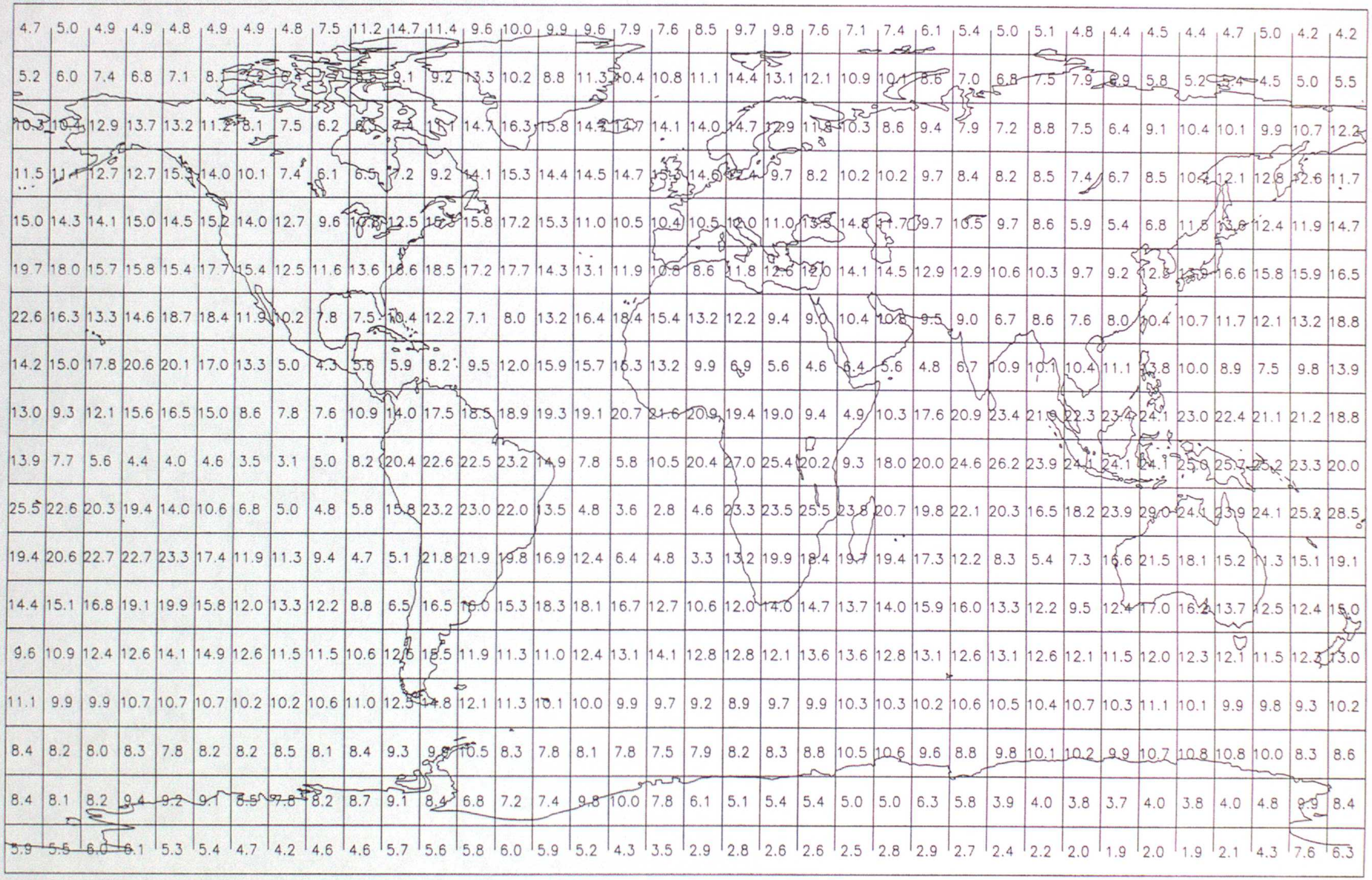
JANUARY 2000 : HIRS8 channel (Surface)
NOAA–15, USING ALL OBSERVATIONS



-8.3	-8.2	-8.6	-9.0	-8.8	-8.4	-8.3	-8.6	-8.1	-4.6	.6	-5.8	-7.4	-6.5	-2.8	-6.8	-9.2	-12.7	-15.8	-16.2	-14.3	-11.3	-10.8	-11.5	-9.8	-7.9	-8.0	-8.6	-8.8	-10.0	-9.8	-9.1	-8.9	-9.5	-9.2	-8.6
-6.1	-6.2	-7.8	-7.9	-8.0	-7.8	-8.5	-10.4	-9.2	-4.4	-1.8	-6.0	-6.9	-2.2	-1.4	-6.5	-13.8	-16.9	-20.8	-18.7	-19.6	-19.2	-18.1	-11.7	-8.9	-8.6	-10.4	-12.2	-12.1	-11.8	-10.6	-10.8	-12.5	-10.8	-9.9	-8.2
-8.5	-10.4	-10.7	-8.3	-6.5	-9.0	-9.7	-7.3	-7.7	-5.9	-7.6	-7.5	-20.0	-12.1	-17.3	[illegible]	-17.3	-18.7	-20.4	-16.0	-13.5	-14.5	-12.3	-10.4	-11.0	-13.4	-11.3	-5.1	-8.2	-9.1	-6.7	-2.8	-1.4	-7.1	-5.5	-7.0
-18.1	-15.4	-14.5	-16.9	-14.6	-6.9	-8.6	-5.9	-8.2	-7.9	-9.3	-8.1	-19.7	-24.6	-18.6	-16.8	-16.3	-14.6	-14.9	-11.9	-11.6	-10.5	-12.2	-12.2	-13.4	-12.7	-10.7	-6.5	-3.8	1.8	-4.6	-3.2	-13.0	-18.0	-18.2	-20.9
-18.8	-16.8	-17.0	-17.2	-17.1	-17.5	-17.2	-13.6	-10.1	-11.8	-9.7	-17.6	-20.7	-20.3	-17.4	-12.8	-11.9	-7.6	-6.0	-6.8	-8.3	-15.0	-13.9	-14.8	-12.2	-9.8	-6.5	-.8	1.7	-.9	-5.3	-10.1	-15.7	-18.7	-15.9	-19.2
-21.2	-21.6	-18.2	-16.1	-16.1	-17.5	-15.8	-12.4	-8.4	-9.1	-15.9	-19.8	-15.6	-14.1	-12.6	-11.5	-10.6	-4.3	-3.4	-8.4	-9.8	-7.3	-6.3	-10.4	-13.5	-9.4	-1.8	.8	-1.8	-5.4	-13.9	-15.9	-19.5	-20.9	-17.9	-17.2
-20.6	-12.3	-9.5	-10.8	-17.9	-17.6	-7.8	-4.2	-3.9	-3.8	-5.4	-6.9	-4.5	-4.7	-9.8	-11.4	-12.9	-10.2	-8.1	-5.9	-2.3	-2.6	-6.4	-6.2	-5.6	-5.4	1.6	1.2	-1.3	-6.0	-13.2	-10.0	-9.6	-9.6	-9.0	-13.9
-8.8	-8.4	-12.4	-19.2	-23.3	-15.0	-8.0	-1.2	-.6	-3.1	-3.1	-5.3	-6.3	-8.2	-13.5	-10.8	-12.5	-12.0	-8.5	-3.1	.4	-.9	-1.6	-2.2	-1.6	-2.6	-3.9	-4.1	-5.8	-7.9	-10.1	-6.8	-5.4	-4.7	-5.5	-8.1
-7.9	-5.7	-7.7	-10.2	-10.6	-8.9	-5.3	-5.4	-6.0	-9.0	-10.3	-13.0	-18.6	-17.9	-17.9	-16.2	-15.1	-18.2	-18.0	-13.7	-11.2	-2.7	-1.4	-4.2	-10.1	-16.8	-23.0	-22.3	-24.1	-29.0	-28.7	-21.1	-20.2	-18.7	-17.1	-13.3
-6.9	-3.5	-2.4	-2.1	-1.7	-2.0	-1.5	-1.6	-3.2	-6.2	-22.4	-31.2	-28.8	-24.4	-10.0	-3.5	-3.0	-6.3	-16.1	-26.3	-28.6	-14.4	-4.0	-11.3	-15.2	-25.4	-27.8	-28.9	-38.8	-40.0	-33.5	-32.8	-30.7	-25.9	-17.6	-13.1
-21.9	-18.4	-15.8	-13.7	-8.3	-6.3	-4.7	-3.8	-4.7	-6.0	-15.7	-24.7	-28.4	-23.2	-7.7	-3.1	-2.9	-2.1	-3.4	-19.5	-29.2	-26.0	-19.3	-13.3	-13.2	-15.2	-12.8	-10.2	-11.7	-19.1	-30.7	-19.5	-19.3	-20.4	-23.0	-28.9
-15.2	-18.0	-25.5	-26.7	-21.8	-12.7	-6.4	-6.5	-6.1	-5.5	-6.0	-15.1	-15.1	-17.4	-10.9	-7.7	-4.1	-3.4	-2.8	-5.9	-16.6	-13.7	-13.8	-16.4	-12.9	-6.4	-4.5	-3.9	-3.8	-3.0	-22.1	-13.1	-9.6	-6.2	-8.8	-14.3
-12.5	-13.7	-15.3	-18.6	-21.4	-13.3	-9.7	-11.7	-10.6	-6.8	-3.5	-10.2	-8.6	-10.8	-15.6	-16.1	-16.9	-11.5	-8.4	-7.9	-10.4	-11.2	-10.8	-10.8	-13.1	-12.8	-10.4	-10.4	-7.2	-8.2	-13.3	-13.9	-8.7	-9.9	-10.0	-11.8
-11.4	-11.1	-13.3	-12.8	-12.9	-14.6	-14.3	-14.0	-13.7	-12.3	-10.7	-9.5	-7.3	-8.5	-8.9	-10.4	-11.3	-14.1	-14.4	-14.8	-14.0	-14.4	-12.8	-11.7	-12.7	-11.7	-12.6	-12.9	-12.6	-11.8	-12.4	-12.1	-11.4	-11.3	-12.0	-12.6
-14.3	-12.6	-11.8	-12.5	-12.8	-12.3	-13.5	-14.8	-14.6	-14.6	-17.4	-17.2	-13.7	-12.3	-11.7	-12.6	-12.6	-12.3	-12.2	-12.9	-14.0	-15.0	-14.3	-13.9	-13.9	-14.1	-15.3	-16.3	-15.9	-14.6	-15.3	-13.2	-12.2	-13.1	-13.0	-12.9
-12.4	-12.5	-13.1	-12.7	-11.5	-12.7	-14.1	-15.4	-14.9	-15.0	-15.4	-14.6	-13.3	-12.3	-13.2	-13.8	-14.2	-13.3	-12.7	-14.0	-14.4	-13.7	-10.5	-9.3	-11.8	-14.3	-11.6	-10.3	-9.8	-10.3	-10.9	-9.0	-9.6	-11.6	-13.5	-14.1
-12.3	-12.4	-11.4	-11.1	-7.8	-5.8	-5.6	-6.7	-5.6	-6.3	-7.8	-8.0	-9.2	-8.4	-9.2	-6.3	-4.4	-1.4	-.5	-.9	-1.1	-.7	.7	1.4	-.5	-.9	1.2	1.2	1.1	1.3	1.4	3.2	4.2	4.6	-1.5	-9.8
-3.6	-3.9	-3.7	.1	.9	-.1	-1.1	-.6	.5	-.7	-2.5	-3.9	-3.8	-3.4	-1.6	.7	1.4	1.4	1.3	1.6	1.7	1.3	1.1	.2	-.4	.0	.2	.6	1.2	1.9	2.8	3.4	3.0	3.4	-1.9	-4.0

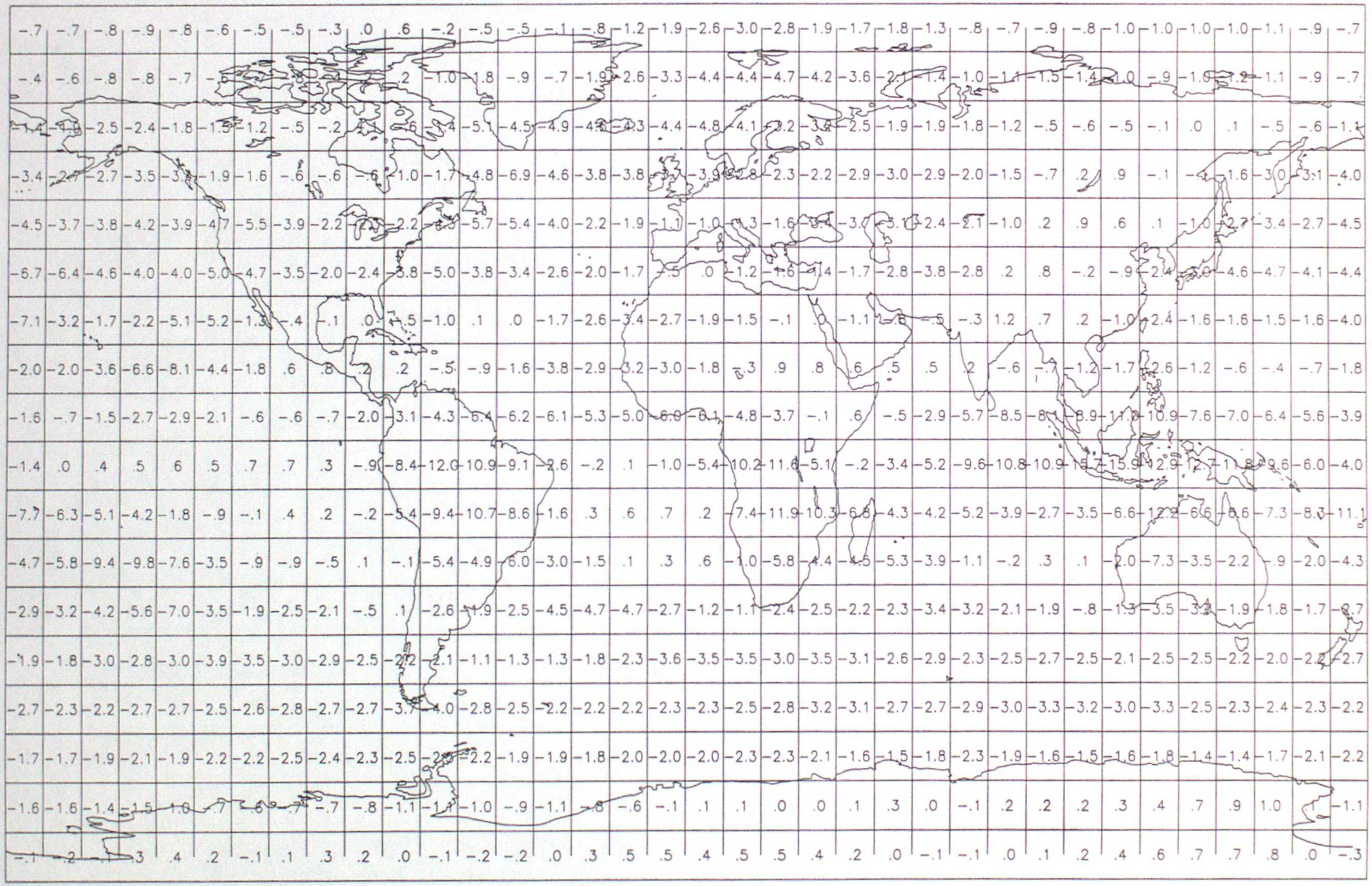
ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JANUARY 2000 : HIRS8 channel (Surface)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 27



4.7	5.0	4.9	4.9	4.8	4.9	4.9	4.8	7.5	11.2	14.7	11.4	9.6	10.0	9.9	9.6	7.9	7.6	8.5	9.7	9.8	7.6	7.1	7.4	6.1	5.4	5.0	5.1	4.8	4.4	4.5	4.4	4.7	5.0	4.2	4.2
5.2	6.0	7.4	6.8	7.1	[illegible]	7.2	6.4	[illegible]	8.5	9.1	9.2	13.3	10.2	8.8	11.3	10.4	10.8	11.1	14.4	13.1	12.1	10.9	10.1	8.6	7.0	6.8	7.5	7.9	6.9	5.8	5.2	5.4	4.5	5.0	5.5
10.3	10.4	12.9	13.7	13.2	11.2	8.1	7.5	6.2	6.5	7.4	11.1	14.7	16.3	15.8	14.2	14.7	14.1	14.0	14.7	12.9	11.8	10.3	8.6	9.4	7.9	7.2	8.8	7.5	6.4	9.1	10.4	10.1	9.9	10.7	12.2
11.5	11.1	12.7	12.7	15.3	14.0	10.1	7.4	6.1	6.5	7.2	9.2	14.1	15.3	14.4	14.5	14.7	15.3	14.6	12.4	9.7	8.2	10.2	10.2	9.7	8.4	8.2	8.5	7.4	6.7	8.5	10.4	12.1	12.8	12.6	11.7
15.0	14.3	14.1	15.0	14.5	15.2	14.0	12.7	9.6	10.8	12.5	15.5	15.8	17.2	15.3	11.0	10.5	10.4	10.5	10.0	11.0	13.5	14.8	11.7	9.7	10.5	9.7	8.6	5.9	5.4	6.8	11.5	13.6	12.4	11.9	14.7
19.7	18.0	15.7	15.8	15.4	17.7	15.4	12.5	11.6	13.6	18.6	18.5	17.2	17.7	14.3	13.1	11.9	10.8	8.6	11.8	12.6	12.0	14.1	14.5	12.9	12.9	10.6	10.3	9.7	9.2	12.8	13.9	16.6	15.8	15.9	16.5
22.6	16.3	13.3	14.6	18.7	18.4	11.9	10.2	7.8	7.5	10.4	12.2	7.1	8.0	13.2	16.4	18.4	15.4	13.2	12.2	9.4	9.0	10.4	10.8	9.5	9.0	6.7	8.6	7.6	8.0	10.4	10.7	11.7	12.1	13.2	18.8
14.2	15.0	17.8	20.6	20.1	17.0	13.3	5.0	4.3	5.6	5.9	8.2	9.5	12.0	15.9	15.7	16.3	13.2	9.9	6.9	5.6	4.6	6.4	5.6	4.8	6.7	10.9	10.1	10.4	11.1	13.8	10.0	8.9	7.5	9.8	13.9
13.0	9.3	12.1	15.6	16.5	15.0	8.6	7.8	7.6	10.9	14.0	17.5	18.5	18.9	19.3	19.1	20.7	21.6	20.9	19.4	19.0	9.4	4.9	10.3	17.6	20.9	23.4	21.9	22.3	23.4	24.1	23.0	22.4	21.1	21.2	18.8
13.9	7.7	5.6	4.4	4.0	4.6	3.5	3.1	5.0	8.2	20.4	22.6	22.5	23.2	14.9	7.8	5.8	10.5	20.4	27.0	25.4	20.2	9.3	18.0	20.0	24.6	26.2	23.9	24.1	24.1	24.1	25.0	25.7	25.2	23.3	20.0
25.5	22.6	20.3	19.4	14.0	10.6	6.8	5.0	4.8	5.8	15.8	23.2	23.0	22.0	13.5	4.8	3.6	2.8	4.6	23.3	23.5	25.5	23.8	20.7	19.8	22.1	20.3	16.5	18.2	23.9	29.0	24.1	23.9	24.1	25.2	28.5
19.4	20.6	22.7	22.7	23.3	17.4	11.9	11.3	9.4	4.7	5.1	21.8	21.9	19.8	16.9	12.4	6.4	4.8	3.3	13.2	19.9	18.4	19.7	19.4	17.3	12.2	8.3	5.4	7.3	16.6	21.5	18.1	15.2	11.3	15.1	19.1
14.4	15.1	16.8	19.1	19.9	15.8	12.0	13.3	12.2	8.8	6.5	16.5	16.0	15.3	18.3	18.1	16.7	12.7	10.6	12.0	14.0	14.7	13.7	14.0	15.9	16.0	13.3	12.2	9.5	12.4	17.0	16.2	13.7	12.5	12.4	15.0
9.6	10.9	12.4	12.6	14.1	14.9	12.6	11.5	11.5	10.6	12.6	15.5	11.9	11.3	11.0	12.4	13.1	14.1	12.8	12.8	12.1	13.6	13.6	12.8	13.1	12.6	13.1	12.6	12.1	11.5	12.0	12.3	12.1	11.5	12.3	13.0
11.1	9.9	9.9	10.7	10.7	10.7	10.2	10.2	10.6	11.0	12.5	14.8	12.1	11.3	10.1	10.0	9.9	9.7	9.2	8.9	9.7	9.9	10.3	10.3	10.2	10.6	10.5	10.4	10.7	10.3	11.1	10.1	9.9	9.8	9.3	10.2
8.4	8.2	8.0	8.3	7.8	8.2	8.2	8.5	8.1	8.4	9.3	9.8	10.5	8.3	7.8	8.1	7.8	7.5	7.9	8.2	8.3	8.8	10.5	10.6	9.6	8.8	9.8	10.1	10.2	9.9	10.7	10.8	10.8	10.0	8.3	8.6
8.4	8.1	8.2	9.4	9.2	9.1	8.5	7.8	8.2	8.7	9.1	8.4	6.8	7.2	7.4	9.8	10.0	7.8	6.1	5.1	5.4	5.4	5.0	5.0	6.3	5.8	3.9	4.0	3.8	3.7	4.0	3.8	4.0	4.8	9.9	8.4
5.9	5.5	6.0	6.1	5.3	5.4	4.7	4.2	4.6	4.6	5.7	5.6	5.8	6.0	5.9	5.2	4.3	3.5	2.9	2.8	2.6	2.6	2.5	2.8	2.9	2.7	2.4	2.2	2.0	1.9	2.0	1.9	2.1	4.3	7.6	6.3

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 28
JANUARY 2000 : HIRS15 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

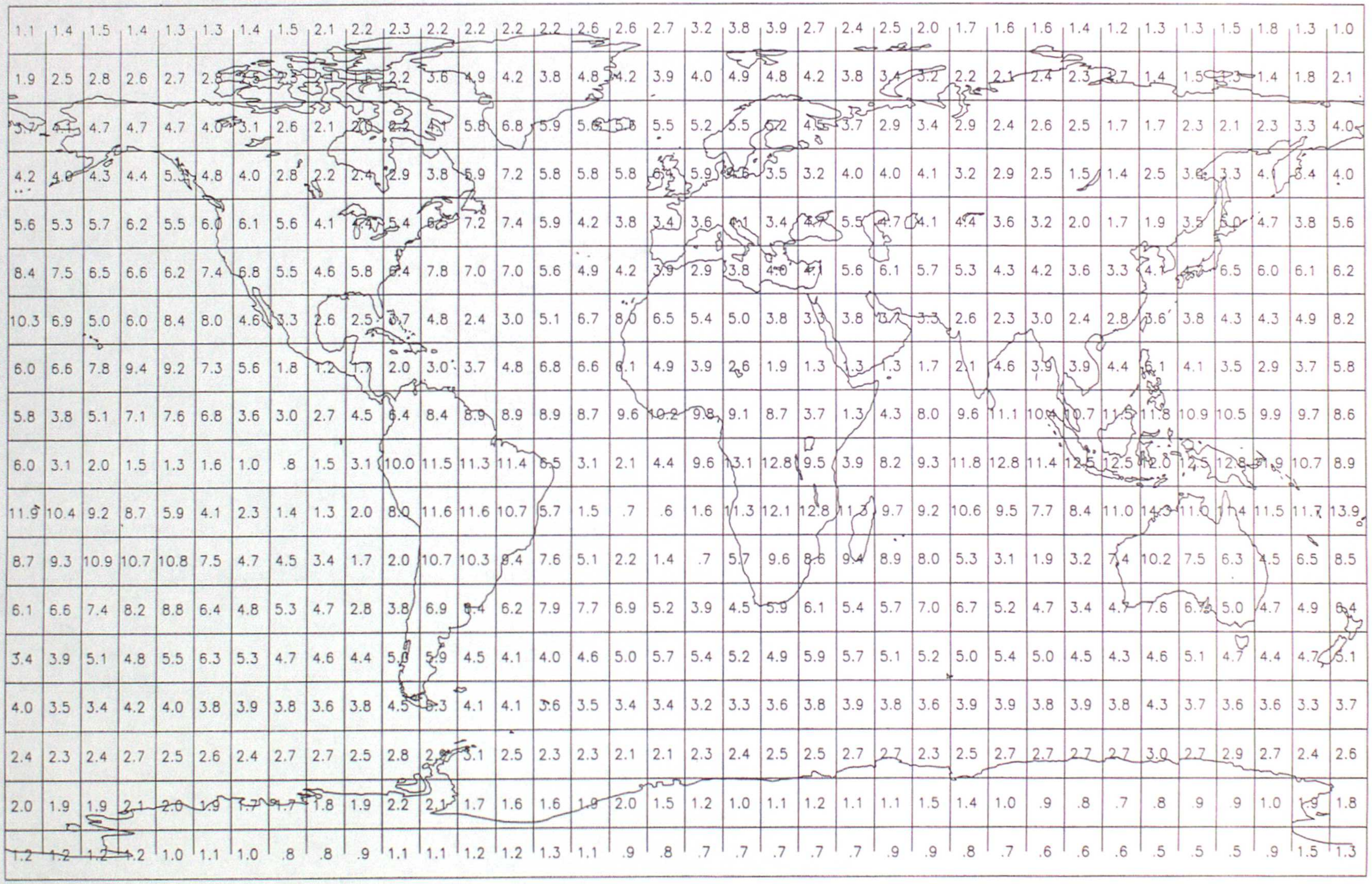

-.7 -.7 -.8 -.9 -.8 -.6 -.5 -.5 -.3 .0 .6 -.2 -.5 -.5 -.1 -.8 -1.2 -1.9 -2.6 -3.0 -2.8 -1.9 -1.7 -1.8 -1.3 -.8 -.7 -.9 -.8 -1.0 -1.0 -1.0 -1.0 -1.1 -.9 -.7
-.4 -.6 -.8 -.8 -.7 -.5 -.7 -.8 -.4 [illegible] .2 -1.0 -1.8 -.9 -.7 -1.9 -2.6 -3.3 -4.4 -4.4 -4.7 -4.2 -3.6 -2.1 -1.4 -1.0 -1.1 -1.5 -1.4 -1.0 -.9 -1.0 -1.2 -1.1 -.9 -.7
-1.4 -1.9 -2.5 -2.4 -1.8 -1.5 -1.2 -.5 -.2 -1.1 -.6 -3.4 -5.1 -4.5 -4.9 -4.6 -4.3 -4.4 -4.8 -4.1 -3.2 -3.2 -2.5 -1.9 -1.9 -1.8 -1.2 -.5 -.6 -.5 -.1 .0 .1 -.5 -.6 -1.1
-3.4 -2.7 -2.7 -3.5 -3.2 -1.9 -1.6 -.6 -.6 -.6 -1.0 -1.7 -4.8 -6.9 -4.6 -3.8 -3.8 -3.7 -3.9 -2.8 -2.3 -2.2 -2.9 -3.0 -2.9 -2.0 -1.5 -.7 .2 .9 -.1 -.1 -1.6 -3.0 -3.1 -4.0
-4.5 -3.7 -3.8 -4.2 -3.9 -4.7 -5.5 -3.9 -2.2 -2.3 -2.2 -4.3 -5.7 -5.4 -4.0 -2.2 -1.9 -1.1 -1.0 -1.3 -1.6 -3.4 -3.0 -3.1 -2.4 -2.1 -1.0 .2 .9 .6 .1 -1.0 -2.7 -3.4 -2.7 -4.5
-6.7 -6.4 -4.6 -4.0 -4.0 -5.0 -4.7 -3.5 -2.0 -2.4 -3.8 -5.0 -3.8 -3.4 -2.6 -2.0 -1.7 -.5 .0 -1.2 -1.6 -1.4 -1.7 -2.8 -3.8 -2.8 .2 .8 -.2 -.9 -2.4 -3.0 -4.6 -4.7 -4.1 -4.4
-7.1 -3.2 -1.7 -2.2 -5.1 -5.2 -1.3 -.4 -.1 .0 -.5 -1.0 .1 .0 -1.7 -2.6 -3.4 -2.7 -1.9 -1.5 -.1 .0 -1.1 -.6 -.5 -.3 1.2 .7 .2 -1.0 -2.4 -1.6 -1.6 -1.5 -1.6 -4.0
-2.0 -2.0 -3.6 -6.6 -8.1 -4.4 -1.8 .6 .8 .2 .2 -.5 -.9 -1.6 -3.8 -2.9 -3.2 -3.0 -1.8 -.3 .9 .8 .6 .5 .5 .2 -.6 -.7 -1.2 -1.7 -2.6 -1.2 -.6 -.4 -.7 -1.8
-1.6 -.7 -1.5 -2.7 -2.9 -2.1 -.6 -.6 -.7 -2.0 -3.1 -4.3 -6.4 -6.2 -6.1 -5.3 -5.0 -6.0 -6.1 -4.8 -3.7 -.1 .6 -.5 -2.9 -5.7 -8.5 -8.1 -8.9 -11.0 -10.9 -7.6 -7.0 -6.4 -5.6 -3.9
-1.4 .0 .4 .5 .6 .5 .7 .7 .3 -.9 -8.4 -12.0 -10.9 -9.1 -2.6 -.2 .1 -1.0 -5.4 -10.2 -11.6 -5.1 -.2 -3.4 -5.2 -9.6 -10.8 -10.9 -15.7 -15.9 -12.9 -12.7 -11.8 -9.6 -6.0 -4.0
-7.7 -6.3 -5.1 -4.2 -1.8 -.9 -.1 .4 .2 -.2 -5.4 -9.4 -10.7 -8.6 -1.6 .3 .6 .7 .2 -7.4 -11.9 -10.3 -6.8 -4.3 -4.2 -5.2 -3.9 -2.7 -3.5 -6.6 -12.2 -6.6 -8.6 -7.3 -8.3 -11.1
-4.7 -5.8 -9.4 -9.8 -7.6 -3.5 -.9 -.9 -.5 .1 -.1 -5.4 -4.9 -6.0 -3.0 -1.5 .1 .3 .6 -1.0 -5.8 -4.4 -4.5 -5.3 -3.9 -1.1 -.2 .3 .1 -2.0 -7.3 -3.5 -2.2 -.9 -2.0 -4.3
-2.9 -3.2 -4.2 -5.6 -7.0 -3.5 -1.9 -2.5 -2.1 -.5 .1 -2.6 -1.9 -2.5 -4.5 -4.7 -4.7 -2.7 -1.2 -1.1 -2.4 -2.5 -2.2 -2.3 -3.4 -3.2 -2.1 -1.9 -.8 -1.3 -3.5 -3.3 -1.9 -1.8 -1.7 -2.7
-1.9 -1.8 -3.0 -2.8 -3.0 -3.9 -3.5 -3.0 -2.9 -2.5 -2.2 -2.1 -1.1 -1.3 -1.3 -1.8 -2.3 -3.6 -3.5 -3.5 -3.0 -3.5 -3.1 -2.6 -2.9 -2.3 -2.5 -2.7 -2.5 -2.1 -2.5 -2.5 -2.2 -2.0 -2.2 -2.7
-2.7 -2.3 -2.2 -2.7 -2.7 -2.5 -2.6 -2.8 -2.7 -2.7 -3.7 -4.0 -2.8 -2.5 -2.2 -2.2 -2.2 -2.3 -2.3 -2.5 -2.8 -3.2 -3.1 -2.7 -2.7 -2.9 -3.0 -3.3 -3.2 -3.0 -3.3 -2.5 -2.3 -2.4 -2.3 -2.2
-1.7 -1.7 -1.9 -2.1 -1.9 -2.2 -2.2 -2.5 -2.4 -2.3 -2.5 -2.0 -2.2 -1.9 -1.9 -1.8 -2.0 -2.0 -2.0 -2.3 -2.3 -2.1 -1.6 -1.5 -1.8 -2.3 -1.9 -1.6 -1.5 -1.6 -1.8 -1.4 -1.4 -1.7 -2.1 -2.2
-1.6 -1.6 -1.4 -1.5 -1.0 -.7 -.6 -.7 -.7 -.8 -1.1 -1.1 -1.0 -.9 -1.1 -.8 -.6 -.1 .1 .1 .0 .0 .1 .3 .0 -.1 .2 .2 .2 .3 .4 .7 .9 1.0 .1 -1.1
-.1 -.2 -.1 .3 .4 .2 -.1 .1 .3 .2 .0 -.1 -.2 -.2 .0 .3 .5 .5 .4 .5 .5 .4 .2 .0 -.1 -.1 .0 .1 .2 .4 .6 .7 .7 .8 .0 -.3

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)

JANUARY 2000 : HIRS15 channel (700 hPa)

NOAA-15, USING ALL OBSERVATIONS

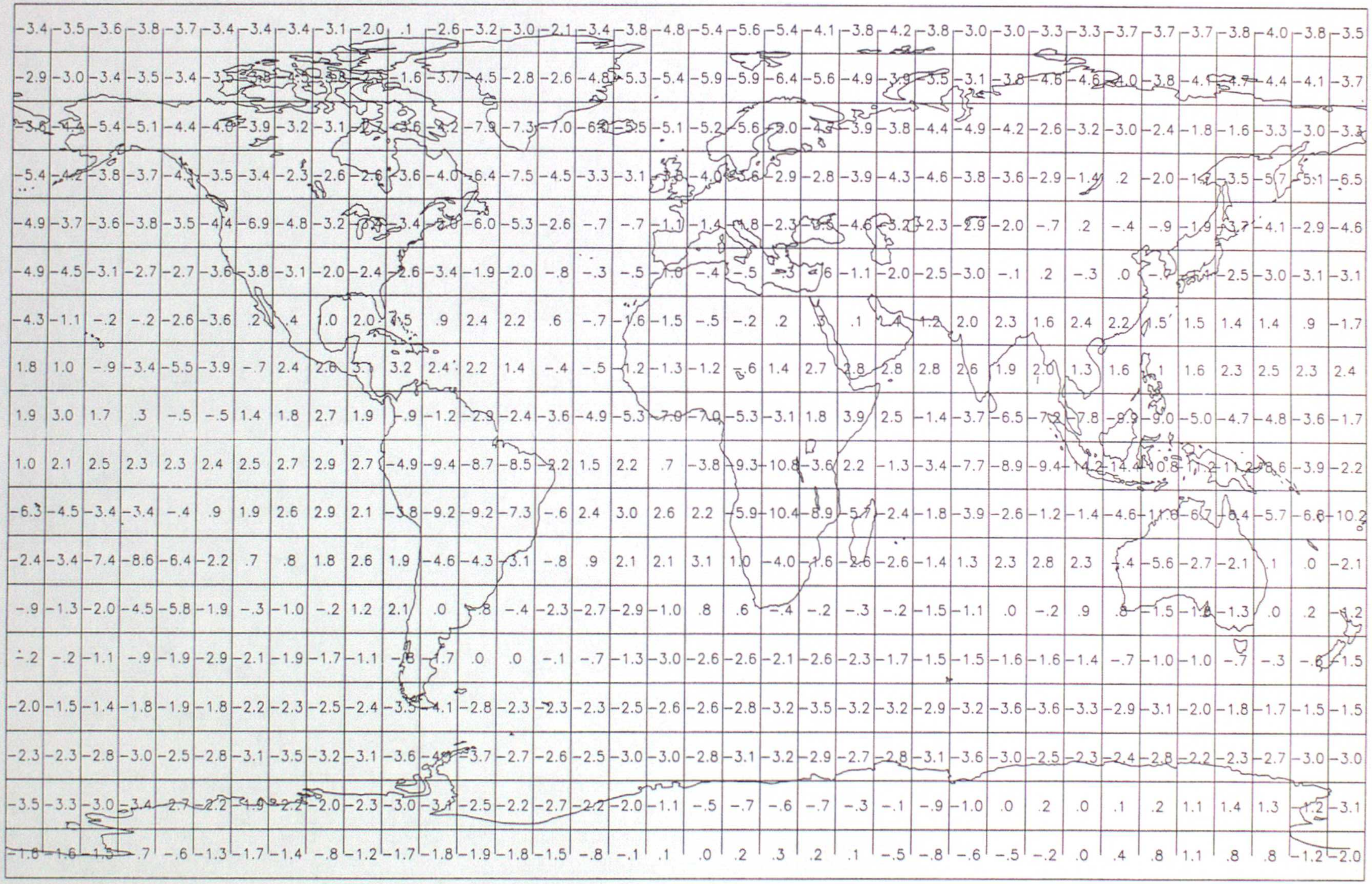
FIGURE 29



1.1	1.4	1.5	1.4	1.3	1.3	1.4	1.5	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.6	2.6	2.7	3.2	3.8	3.9	2.7	2.4	2.5	2.0	1.7	1.6	1.6	1.4	1.2	1.3	1.3	1.5	1.8	1.3	1.0
1.9	2.5	2.8	2.6	2.7	2.8	2.5	2.3	[illegible]	1.6	2.2	3.6	4.9	4.2	3.8	4.8	4.2	3.9	4.0	4.9	4.8	4.2	3.8	3.4	3.2	2.2	2.1	2.4	2.3	2.7	1.4	1.5	2.3	1.4	1.8	2.1
3.7	4.1	4.7	4.7	4.7	4.0	3.1	2.6	2.1	2.0	2.2	4.1	5.8	6.8	5.9	5.6	5.8	5.5	5.2	5.5	5.2	4.5	3.7	2.9	3.4	2.9	2.4	2.6	2.5	1.7	1.7	2.3	2.1	2.3	3.3	4.0
4.2	4.0	4.3	4.4	5.3	4.8	4.0	2.8	2.2	2.4	2.9	3.8	5.9	7.2	5.8	5.8	5.8	6.4	5.9	4.6	3.5	3.2	4.0	4.0	4.1	3.2	2.9	2.5	1.5	1.4	2.5	3.6	3.3	4.1	3.4	4.0
5.6	5.3	5.7	6.2	5.5	6.0	6.1	5.6	4.1	4.4	5.4	[illegible]	7.2	7.4	5.9	4.2	3.8	3.4	3.6	4.1	3.4	4.7	5.5	4.7	4.1	4.4	3.6	3.2	2.0	1.7	1.9	3.5	5.0	4.7	3.8	5.6
8.4	7.5	6.5	6.6	6.2	7.4	6.8	5.5	4.6	5.8	6.4	7.8	7.0	7.0	5.6	4.9	4.2	3.9	2.9	3.8	4.0	4.1	5.6	6.1	5.7	5.3	4.3	4.2	3.6	3.3	4.1	[illegible]	6.5	6.0	6.1	6.2
10.3	6.9	5.0	6.0	8.4	8.0	4.6	3.3	2.6	2.5	3.7	4.8	2.4	3.0	5.1	6.7	8.0	6.5	5.4	5.0	3.8	3.3	3.8	3.7	3.3	2.6	2.3	3.0	2.4	2.8	3.6	3.8	4.3	4.3	4.9	8.2
6.0	6.6	7.8	9.4	9.2	7.3	5.6	1.8	1.2	1.7	2.0	3.0	3.7	4.8	6.8	6.6	6.1	4.9	3.9	2.6	1.9	1.3	1.3	1.3	1.7	2.1	4.6	3.9	3.9	4.4	6.1	4.1	3.5	2.9	3.7	5.8
5.8	3.8	5.1	7.1	7.6	6.8	3.6	3.0	2.7	4.5	6.4	8.4	8.9	8.9	8.9	8.7	9.6	10.2	9.8	9.1	8.7	3.7	1.3	4.3	8.0	9.6	11.1	10.4	10.7	11.5	11.8	10.9	10.5	9.9	9.7	8.6
6.0	3.1	2.0	1.5	1.3	1.6	1.0	.8	1.5	3.1	10.0	11.5	11.3	11.4	6.5	3.1	2.1	4.4	9.6	13.1	12.8	9.5	3.9	8.2	9.3	11.8	12.8	11.4	12.5	12.5	12.0	12.5	12.8	11.9	10.7	8.9
11.9	10.4	9.2	8.7	5.9	4.1	2.3	1.4	1.3	2.0	8.0	11.6	11.6	10.7	5.7	1.5	.7	.6	1.6	11.3	12.1	12.8	11.3	9.7	9.2	10.6	9.5	7.7	8.4	11.0	14.3	11.0	11.4	11.5	11.7	13.9
8.7	9.3	10.9	10.7	10.8	7.5	4.7	4.5	3.4	1.7	2.0	10.7	10.3	8.4	7.6	5.1	2.2	1.4	.7	5.7	9.6	8.6	9.4	8.9	8.0	5.3	3.1	1.9	3.2	7.4	10.2	7.5	6.3	4.5	6.5	8.5
6.1	6.6	7.4	8.2	8.8	6.4	4.8	5.3	4.7	2.8	3.8	6.9	8.4	6.2	7.9	7.7	6.9	5.2	3.9	4.5	5.9	6.1	5.4	5.7	7.0	6.7	5.2	4.7	3.4	4.7	7.6	6.7	5.0	4.7	4.9	6.4
3.4	3.9	5.1	4.8	5.5	6.3	5.3	4.7	4.6	4.4	5.0	5.9	4.5	4.1	4.0	4.6	5.0	5.7	5.4	5.2	4.9	5.9	5.7	5.1	5.2	5.0	5.4	5.0	4.5	4.3	4.6	5.1	4.7	4.4	4.7	5.1
4.0	3.5	3.4	4.2	4.0	3.8	3.9	3.8	3.6	3.8	4.5	[illegible]	4.1	4.1	3.6	3.5	3.4	3.4	3.2	3.3	3.6	3.8	3.9	3.8	3.6	3.9	3.9	3.8	3.9	3.8	4.3	3.7	3.6	3.6	3.3	3.7
2.4	2.3	2.4	2.7	2.5	2.6	2.4	2.7	2.7	2.5	2.8	2.9	3.1	2.5	2.3	2.3	2.1	2.1	2.3	2.4	2.5	2.5	2.7	2.7	2.3	2.5	2.7	2.7	2.7	2.7	3.0	2.7	2.9	2.7	2.4	2.6
2.0	1.9	1.9	2.1	2.0	1.9	1.7	1.7	1.8	1.9	2.2	2.1	1.7	1.6	1.6	1.9	2.0	1.5	1.2	1.0	1.1	1.2	1.1	1.1	1.5	1.4	1.0	.9	.8	.7	.8	.9	.9	1.0	1.9	1.8
1.2	1.2	1.2	1.2	1.0	1.1	1.0	.8	.8	.9	1.1	1.1	1.2	1.2	1.3	1.1	.9	.8	.7	.7	.7	.7	.7	.9	.9	.8	.7	.6	.6	.6	.5	.5	.5	.9	1.5	1.3

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
JANUARY 2000 : HIRS11 Channel (500-700 hPa)
NOAA-15, USING ALL OBSERVATIONS

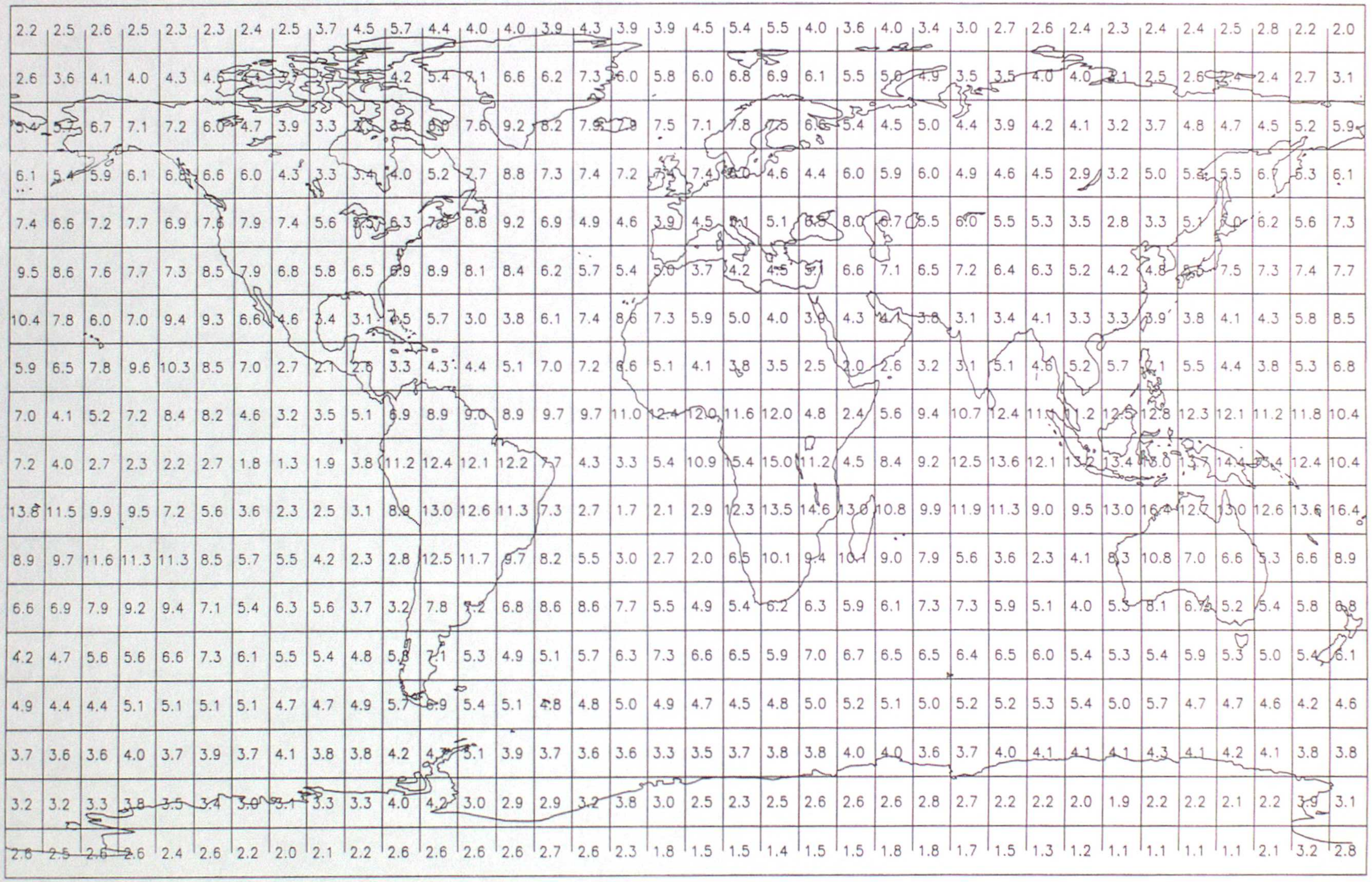
FIGURE 30



-3.4	-3.5	-3.6	-3.8	-3.7	-3.4	-3.4	-3.4	-3.1	-2.0	.1	-2.6	-3.2	-3.0	-2.1	-3.4	-3.8	-4.8	-5.4	-5.6	-5.4	-4.1	-3.8	-4.2	-3.8	-3.0	-3.0	-3.3	-3.3	-3.7	-3.7	-3.7	-3.8	-4.0	-3.8	-3.5
-2.9	-3.0	-3.4	-3.5	-3.4	-3.5	-3.8	[illegible]	-3.8	[illegible]	-1.6	-3.7	-4.5	-2.8	-2.6	-4.8	-5.3	-5.4	-5.9	-5.9	-6.4	-5.6	-4.9	-3.9	-3.5	-3.1	-3.8	-4.6	-4.6	-4.0	-3.8	-4.1	-4.7	-4.4	-4.1	-3.7
-3.6	-4.4	-5.4	-5.1	-4.4	-4.0	-3.9	-3.2	-3.1	-2.7	-3.6	-4.2	-7.9	-7.3	-7.0	-6.3	-5.5	-5.1	-5.2	-5.6	-5.0	-4.7	-3.9	-3.8	-4.4	-4.9	-4.2	-2.6	-3.2	-3.0	-2.4	-1.8	-1.6	-3.3	-3.0	-3.3
-5.4	-4.2	-3.8	-3.7	-4.3	-3.5	-3.4	-2.3	-2.6	-2.6	-3.6	-4.0	-6.4	-7.5	-4.5	-3.3	-3.1	-3.5	-4.0	-5.6	-2.9	-2.8	-3.9	-4.3	-4.6	-3.8	-3.6	-2.9	-1.4	.2	-2.0	-1.7	-3.5	-5.7	-5.1	-6.5
-4.9	-3.7	-3.6	-3.8	-3.5	-4.4	-6.9	-4.8	-3.2	[illegible]	-3.4	-2.0	-6.0	-5.3	-2.6	-.7	-.7	-1.1	-1.4	-4.8	-2.3	-3.5	-4.6	-3.2	-2.3	-2.9	-2.0	-.7	.2	-.4	-.9	-1.9	-3.7	-4.1	-2.9	-4.6
-4.9	-4.5	-3.1	-2.7	-2.7	-3.6	-3.8	-3.1	-2.0	-2.4	-2.6	-3.4	-1.9	-2.0	-.8	-.3	-.5	-1.0	-.4	-.5	-.3	.6	-1.1	-2.0	-2.5	-3.0	-.1	.2	-.3	.0	-.7	-1.1	-2.5	-3.0	-3.1	-3.1
-4.3	-1.1	-.2	-.2	-2.6	-3.6	.2	.4	1.0	2.0	1.5	.9	2.4	2.2	.6	-.7	-1.6	-1.5	-.5	-.2	.2	.3	.1	1.4	1.2	2.0	2.3	1.6	2.4	2.2	1.5	1.5	1.4	1.4	.9	-1.7
1.8	1.0	-.9	-3.4	-5.5	-3.9	-.7	2.4	2.6	3.1	3.2	2.4	2.2	1.4	-.4	-.5	-1.2	-1.3	-1.2	.6	1.4	2.7	2.8	2.8	2.8	2.6	1.9	2.0	1.3	1.6	1	1.6	2.3	2.5	2.3	2.4
1.9	3.0	1.7	.3	-.5	-.5	1.4	1.8	2.7	1.9	-.9	-1.2	-2.9	-2.4	-3.6	-4.9	-5.3	-7.0	-7.0	-5.3	-3.1	1.8	3.9	2.5	-1.4	-3.7	-6.5	-7.2	-7.8	-8.9	-9.0	-5.0	-4.7	-4.8	-3.6	-1.7
1.0	2.1	2.5	2.3	2.3	2.4	2.5	2.7	2.9	2.7	-4.9	-9.4	-8.7	-8.5	-2.2	1.5	2.2	.7	-3.8	-9.3	-10.8	-3.6	2.2	-1.3	-3.4	-7.7	-8.9	-9.4	-14.2	-14.4	-10.8	-11.2	-11.2	-8.6	-3.9	-2.2
-6.3	-4.5	-3.4	-3.4	-.4	.9	1.9	2.6	2.9	2.1	-3.8	-9.2	-9.2	-7.3	-.6	2.4	3.0	2.6	2.2	-5.9	-10.4	-8.9	-5.7	-2.4	-1.8	-3.9	-2.6	-1.2	-1.4	-4.6	-11.6	-6.7	-6.4	-5.7	-6.6	-10.2
-2.4	-3.4	-7.4	-8.6	-6.4	-2.2	.7	.8	1.8	2.6	1.9	-4.6	-4.3	-3.1	-.8	.9	2.1	2.1	3.1	1.0	-4.0	-1.6	-2.6	-2.6	-1.4	1.3	2.3	2.8	2.3	-.4	-5.6	-2.7	-2.1	.1	.0	-2.1
-.9	-1.3	-2.0	-4.5	-5.8	-1.9	-.3	-1.0	-.2	1.2	2.1	.0	-.8	-.4	-2.3	-2.7	-2.9	-1.0	.8	.6	-.4	-.2	-.3	-.2	-1.5	-1.1	.0	-.2	.9	.8	-1.5	-1.8	-1.3	.0	.2	-1.2
-.2	-.2	-1.1	-.9	-1.9	-2.9	-2.1	-1.9	-1.7	-1.1	-.8	-1.7	.0	.0	-.1	-.7	-1.3	-3.0	-2.6	-2.6	-2.1	-2.6	-2.3	-1.7	-1.5	-1.5	-1.6	-1.6	-1.4	-.7	-1.0	-1.0	-.7	-.3	-.6	-1.5
-2.0	-1.5	-1.4	-1.8	-1.9	-1.8	-2.2	-2.3	-2.5	-2.4	-3.5	-4.1	-2.8	-2.3	-2.3	-2.3	-2.5	-2.6	-2.6	-2.8	-3.2	-3.5	-3.2	-3.2	-2.9	-3.2	-3.6	-3.6	-3.3	-2.9	-3.1	-2.0	-1.8	-1.7	-1.5	-1.5
-2.3	-2.3	-2.8	-3.0	-2.5	-2.8	-3.1	-3.5	-3.2	-3.1	-3.6	[illegible]	-3.7	-2.7	-2.6	-2.5	-3.0	-3.0	-2.8	-3.1	-3.2	-2.9	-2.7	-2.8	-3.1	-3.6	-3.0	-2.5	-2.3	-2.4	-2.8	-2.2	-2.3	-2.7	-3.0	-3.0
-3.5	-3.3	-3.0	-3.4	-2.7	-2.2	-1.9	-2.2	-2.0	-2.3	-3.0	-3.1	-2.5	-2.2	-2.7	-2.2	-2.0	-1.1	-.5	-.7	-.6	-.7	-.3	-.1	-.9	-1.0	.0	.2	.0	.1	.2	1.1	1.4	1.3	-1.2	-3.1
-1.8	-1.6	-1.5	.7	-.6	-1.3	-1.7	-1.4	-.8	-1.2	-1.7	-1.8	-1.9	-1.8	-1.5	-.8	-.1	.1	.0	.2	.3	.2	.1	-.5	-.8	-.6	-.5	-.2	.0	.4	.8	1.1	.8	.8	-1.2	-2.0

ATOVS : SD O−B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JANUARY 2000 : HIRS11 channel (500−700 hPa)
NOAA−15, USING ALL OBSERVATIONS

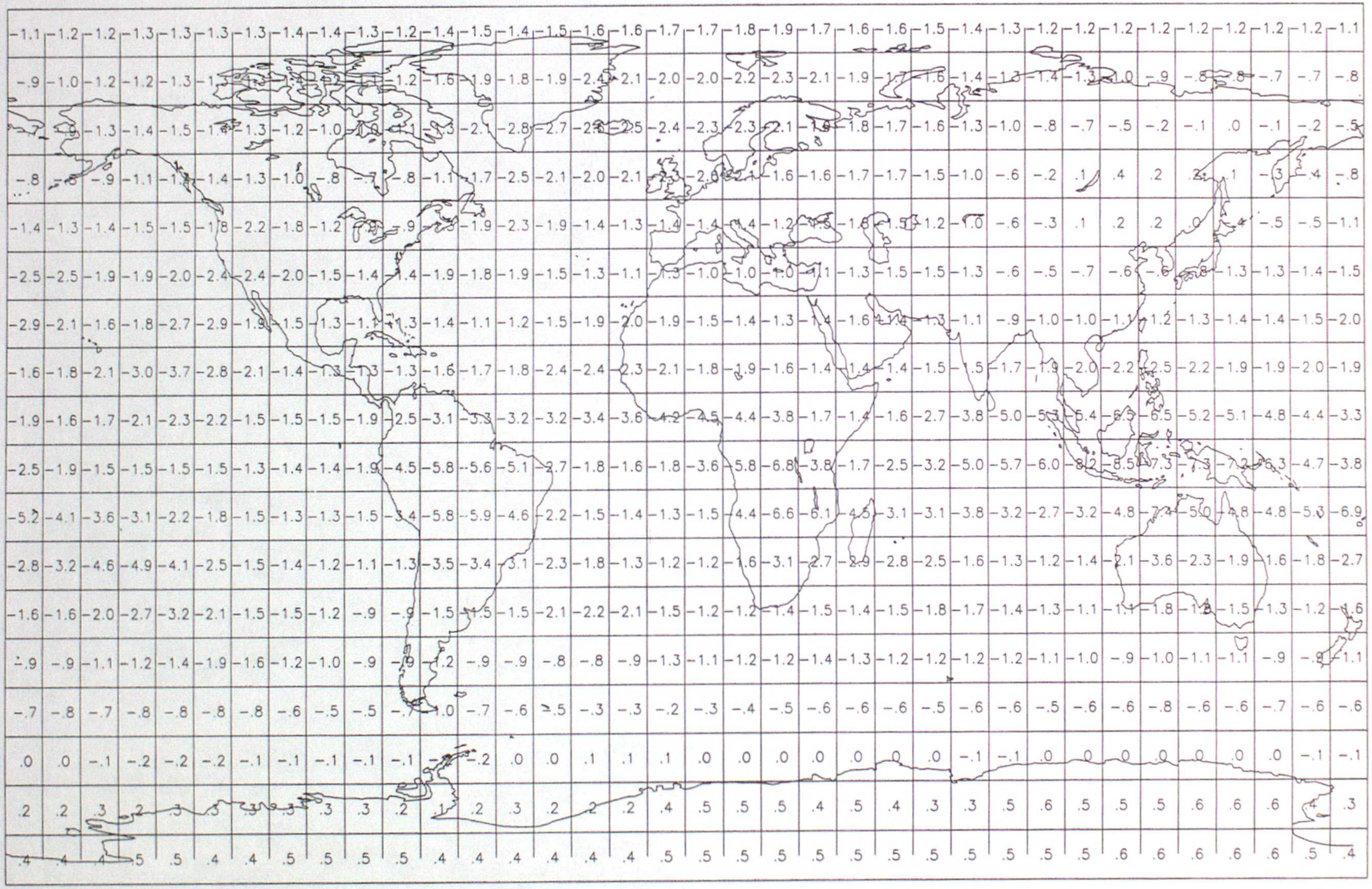
FIGURE 31



2.2	2.5	2.6	2.5	2.3	2.3	2.4	2.5	3.7	4.5	5.7	4.4	4.0	4.0	3.9	4.3	3.9	3.9	4.5	5.4	5.5	4.0	3.6	4.0	3.4	3.0	2.7	2.6	2.4	2.3	2.4	2.4	2.5	2.8	2.2	2.0
2.6	3.6	4.1	4.0	4.3	4.6	[illegible]	3.7	[illegible]	[illegible]	4.2	5.4	7.1	6.6	6.2	7.3	6.0	5.8	6.0	6.8	6.9	6.1	5.5	5.0	4.9	3.5	3.5	4.0	4.0	2.1	2.5	2.6	2.4	2.4	2.7	3.1
5.4	5.7	6.7	7.1	7.2	6.0	4.7	3.9	3.3	[illegible]	3.8	6.0	7.6	9.2	8.2	7.9	7.8	7.5	7.1	7.8	7.5	6.6	5.4	4.5	5.0	4.4	3.9	4.2	4.1	3.2	3.7	4.8	4.7	4.5	5.2	5.9
6.1	5.4	5.9	6.1	6.8	6.6	6.0	4.3	3.3	3.4	4.0	5.2	7.7	8.8	7.3	7.4	7.2	7.4	7.4	8.0	4.6	4.4	6.0	5.9	6.0	4.9	4.6	4.5	2.9	3.2	5.0	5.3	5.5	6.7	5.3	6.1
7.4	6.6	7.2	7.7	6.9	7.6	7.9	7.4	5.6	3.5	6.3	7.8	8.8	9.2	6.9	4.9	4.6	3.9	4.5	8.1	5.1	6.5	8.0	6.7	5.5	6.0	5.5	5.3	3.5	2.8	3.3	5.1	5.0	6.2	5.6	7.3
9.5	8.6	7.6	7.7	7.3	8.5	7.9	6.8	5.8	6.5	6.9	8.9	8.1	8.4	6.2	5.7	5.4	5.0	3.7	4.2	4.5	5.1	6.6	7.1	6.5	7.2	6.4	6.3	5.2	4.2	4.8	5.5	7.5	7.3	7.4	7.7
10.4	7.8	6.0	7.0	9.4	9.3	6.6	4.6	3.4	3.1	4.5	5.7	3.0	3.8	6.1	7.4	8.6	7.3	5.9	5.0	4.0	3.9	4.3	4.1	3.8	3.1	3.4	4.1	3.3	3.3	3.9	3.8	4.1	4.3	5.8	8.5
5.9	6.5	7.8	9.6	10.3	8.5	7.0	2.7	2.1	2.6	3.3	4.3	4.4	5.1	7.0	7.2	6.6	5.1	4.1	3.8	3.5	2.5	2.0	2.6	3.2	3.1	5.1	4.6	5.2	5.7	7.1	5.5	4.4	3.8	5.3	6.8
7.0	4.1	5.2	7.2	8.4	8.2	4.6	3.2	3.5	5.1	6.9	8.9	9.0	8.9	9.7	9.7	11.0	12.4	12.0	11.6	12.0	4.8	2.4	5.6	9.4	10.7	12.4	11.1	11.2	12.5	12.8	12.3	12.1	11.2	11.8	10.4
7.2	4.0	2.7	2.3	2.2	2.7	1.8	1.3	1.9	3.8	11.2	12.4	12.1	12.2	7.7	4.3	3.3	5.4	10.9	15.4	15.0	11.2	4.5	8.4	9.2	12.5	13.6	12.1	13.2	13.4	13.0	13.7	14.4	15.4	12.4	10.4
13.8	11.5	9.9	9.5	7.2	5.6	3.6	2.3	2.5	3.1	8.9	13.0	12.6	11.3	7.3	2.7	1.7	2.1	2.9	12.3	13.5	14.6	13.0	10.8	9.9	11.9	11.3	9.0	9.5	13.0	16.4	12.7	13.0	12.6	13.6	16.4
8.9	9.7	11.6	11.3	11.3	8.5	5.7	5.5	4.2	2.3	2.8	12.5	11.7	9.7	8.2	5.5	3.0	2.7	2.0	6.5	10.1	9.4	10.1	9.0	7.9	5.6	3.6	2.3	4.1	8.3	10.8	7.0	6.6	5.3	6.6	8.9
6.6	6.9	7.9	9.2	9.4	7.1	5.4	6.3	5.6	3.7	3.2	7.8	7.2	6.8	8.6	8.6	7.7	5.5	4.9	5.4	6.2	6.3	5.9	6.1	7.3	7.3	5.9	5.1	4.0	5.3	8.1	6.7	5.2	5.4	5.8	6.8
4.2	4.7	5.6	5.6	6.6	7.3	6.1	5.5	5.4	4.8	5.8	7.1	5.3	4.9	5.1	5.7	6.3	7.3	6.6	6.5	5.9	7.0	6.7	6.5	6.5	6.4	6.5	6.0	5.4	5.3	5.4	5.9	5.3	5.0	5.4	6.1
4.9	4.4	4.4	5.1	5.1	5.1	5.1	4.7	4.7	4.9	5.7	6.9	5.4	5.1	4.8	4.8	5.0	4.9	4.7	4.5	4.8	5.0	5.2	5.1	5.0	5.2	5.2	5.3	5.4	5.0	5.7	4.7	4.7	4.6	4.2	4.6
3.7	3.6	3.6	4.0	3.7	3.9	3.7	4.1	3.8	3.8	4.2	4.7	5.1	3.9	3.7	3.6	3.6	3.3	3.5	3.7	3.8	3.8	4.0	4.0	3.6	3.7	4.0	4.1	4.1	4.1	4.3	4.1	4.2	4.1	3.8	3.8
3.2	3.2	3.3	3.8	3.5	3.4	3.0	3.1	3.3	3.3	4.0	4.2	3.0	2.9	2.9	3.2	3.8	3.0	2.5	2.3	2.5	2.6	2.6	2.6	2.8	2.7	2.2	2.2	2.0	1.9	2.2	2.2	2.1	2.2	3.9	3.1
2.8	2.5	2.6	2.6	2.4	2.6	2.2	2.0	2.1	2.2	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.3	1.8	1.5	1.5	1.4	1.5	1.5	1.8	1.8	1.7	1.5	1.3	1.2	1.1	1.1	1.1	1.1	2.1	3.2	2.8

ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
JANUARY 2000 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

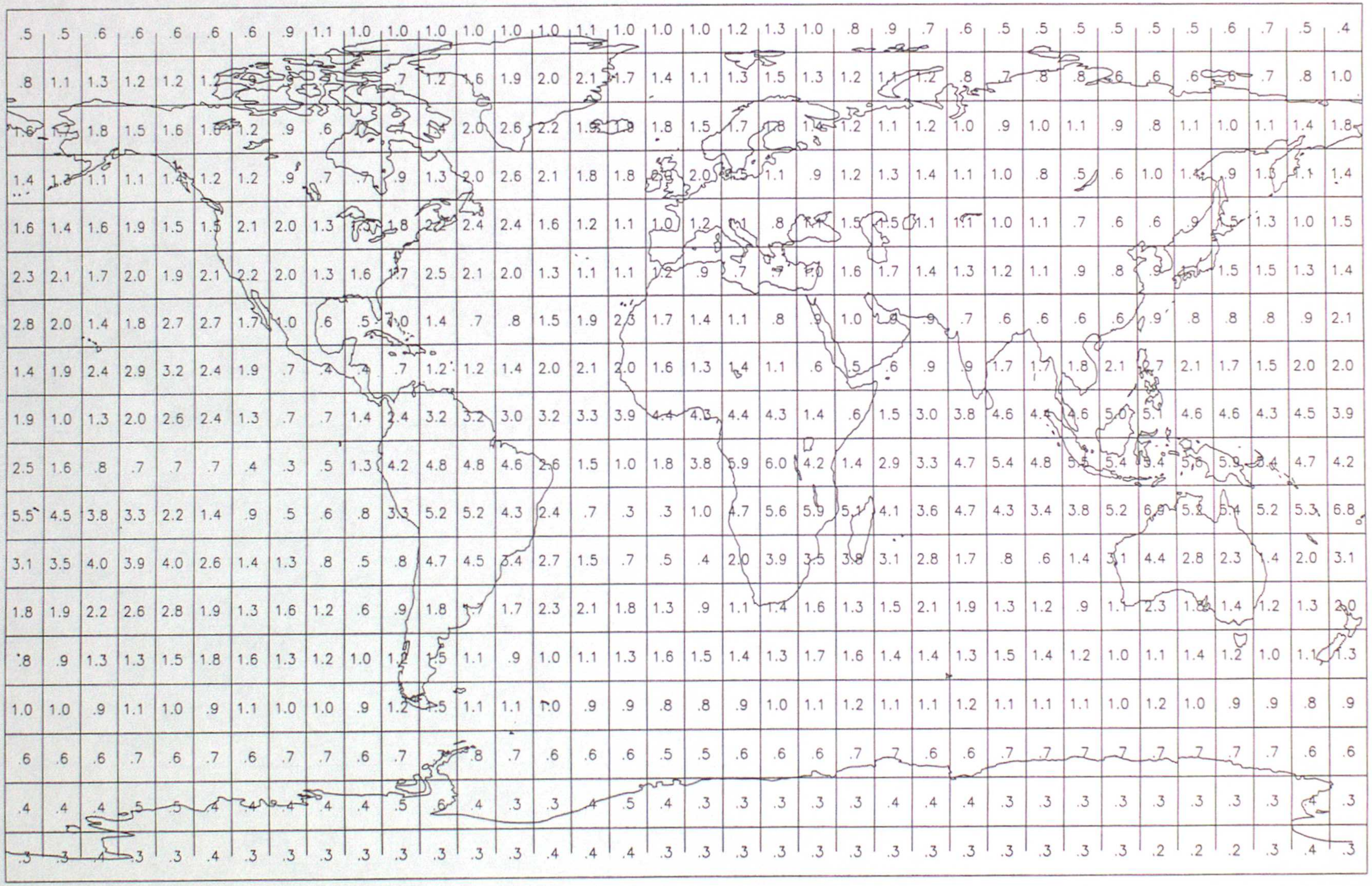
FIGURE 32



-1.1	-1.2	-1.2	-1.3	-1.3	-1.3	-1.3	-1.4	-1.4	-1.3	-1.2	-1.4	-1.5	-1.4	-1.5	-1.6	-1.6	-1.7	-1.7	-1.8	-1.9	-1.7	-1.6	-1.6	-1.5	-1.4	-1.3	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.1
-.9	-1.0	-1.2	-1.2	-1.3	-1.3	-1.3	-1.4	-1.2	-1.1	-1.2	-1.6	-1.9	-1.8	-1.9	-2.4	-2.1	-2.0	-2.0	-2.2	-2.3	-2.1	-1.9	-1.7	-1.6	-1.4	-1.3	-1.4	-1.3	-1.0	-.9	-.8	-.8	-.7	-.7	-.8
-.7	-.9	-1.3	-1.4	-1.5	-1.4	-1.3	-1.2	-1.0	-1.0	-1.1	-1.3	-2.1	-2.8	-2.7	-2.6	-2.5	-2.4	-2.3	-2.3	-2.1	-1.9	-1.8	-1.7	-1.6	-1.3	-1.0	-.8	-.7	-.5	-.2	-.1	.0	-.1	-.2	-.5
-.8	-.6	-.9	-1.1	-1.2	-1.4	-1.3	-1.0	-.8	-.7	-.8	-1.1	-1.7	-2.5	-2.1	-2.0	-2.1	-2.3	-2.6	-2.1	-1.6	-1.6	-1.7	-1.7	-1.5	-1.0	-.6	-.2	.1	.4	.2	.2	.1	-.3	-.4	-.8
-1.4	-1.3	-1.4	-1.5	-1.5	-1.8	-2.2	-1.8	-1.2	-.9	-.9	-2.3	-1.9	-2.3	-1.9	-1.4	-1.3	-1.4	-1.4	-1.4	-1.2	-1.5	-1.8	-1.5	-1.2	-1.0	-.6	-.3	.1	.2	.2	.0	-.4	-.5	-.5	-1.1
-2.5	-2.5	-1.9	-1.9	-2.0	-2.4	-2.4	-2.0	-1.5	-1.4	-1.4	-1.9	-1.8	-1.9	-1.5	-1.3	-1.1	-1.3	-1.0	-1.0	-1.0	-1.1	-1.3	-1.5	-1.5	-1.3	-.6	-.5	-.7	-.6	-.6	-.8	-1.3	-1.3	-1.4	-1.5
-2.9	-2.1	-1.6	-1.8	-2.7	-2.9	-1.9	-1.5	-1.3	-1.1	-1.3	-1.4	-1.1	-1.2	-1.5	-1.9	-2.0	-1.9	-1.5	-1.4	-1.3	-1.4	-1.6	-1.4	-1.3	-1.1	-.9	-1.0	-1.0	-1.1	-1.2	-1.3	-1.4	-1.4	-1.5	-2.0
-1.6	-1.8	-2.1	-3.0	-3.7	-2.8	-2.1	-1.4	-1.3	-1.3	-1.3	-1.6	-1.7	-1.8	-2.4	-2.4	-2.3	-2.1	-1.8	-1.9	-1.6	-1.4	-1.4	-1.4	-1.5	-1.5	-1.7	-1.9	-2.0	-2.2	-2.5	-2.2	-1.9	-1.9	-2.0	-1.9
-1.9	-1.6	-1.7	-2.1	-2.3	-2.2	-1.5	-1.5	-1.5	-1.9	-2.5	-3.1	-3.3	-3.2	-3.2	-3.4	-3.6	-4.2	-4.5	-4.4	-3.8	-1.7	-1.4	-1.6	-2.7	-3.8	-5.0	-5.3	-5.4	-6.5	-6.5	-5.2	-5.1	-4.8	-4.4	-3.3
-2.5	-1.9	-1.5	-1.5	-1.5	-1.5	-1.3	-1.4	-1.4	-1.9	-4.5	-5.8	--5.6	-5.1	-2.7	-1.8	-1.6	-1.8	-3.6	-5.8	-6.8	-3.8	-1.7	-2.5	-3.2	-5.0	-5.7	-6.0	-8.2	-8.5	-7.3	-7.3	-7.2	-6.3	-4.7	-3.8
-5.2	-4.1	-3.6	-3.1	-2.2	-1.8	-1.5	-1.3	-1.3	-1.5	-3.4	-5.8	--5.9	-4.6	-2.2	-1.5	-1.4	-1.3	-1.5	-4.4	-6.6	-6.1	-4.5	-3.1	-3.1	-3.8	-3.2	-2.7	-3.2	-4.8	-7.4	-5.0	-4.8	-4.8	-5.3	-6.9
-2.8	-3.2	-4.6	-4.9	-4.1	-2.5	-1.5	-1.4	-1.2	-1.1	-1.3	-3.5	-3.4	-3.1	-2.3	-1.8	-1.3	-1.2	-1.2	-1.6	-3.1	-2.7	-2.9	-2.8	-2.5	-1.6	-1.3	-1.2	-1.4	-2.1	-3.6	-2.3	-1.9	-1.6	-1.8	-2.7
-1.6	-1.6	-2.0	-2.7	-3.2	-2.1	-1.5	-1.5	-1.2	-.9	-.9	-1.5	-1.5	-1.5	-2.1	-2.2	-2.1	-1.5	-1.2	-1.2	-1.4	-1.5	-1.4	-1.5	-1.8	-1.7	-1.4	-1.3	-1.1	-1.1	-1.8	-1.3	-1.5	-1.3	-1.2	-1.6
-.9	-.9	-1.1	-1.2	-1.4	-1.9	-1.6	-1.2	-1.0	-.9	-.9	-1.2	-.9	-.9	-.8	-.8	-.9	-1.3	-1.1	-1.2	-1.2	-1.4	-1.3	-1.2	-1.2	-1.2	-1.2	-1.1	-1.0	-.9	-1.0	-1.1	-1.1	-.9	-.9	-1.1
-.7	-.8	-.7	-.8	-.8	-.8	-.8	-.6	-.5	-.5	-.7	-1.0	-.7	-.6	-.5	-.3	-.3	-.2	-.3	-.4	-.5	-.6	-.6	-.6	-.5	-.6	-.6	-.5	-.6	-.6	-.8	-.6	-.6	-.7	-.6	-.6
.0	.0	-.1	-.2	-.2	-.2	-.1	-.1	-.1	-.1	-.1	[illegible]	-.2	.0	.0	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	-.1	-.1
.2	.2	.3	.2	.3	.3	.3	.3	.3	.3	.2	.1	.2	.3	.2	.2	.2	.4	.5	.5	.5	.4	.5	.4	.3	.3	.5	.6	.5	.5	.5	.6	.6	.6	.4	.3
.4	.4	.4	.5	.5	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.5	.4

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JANUARY 2000 : HIRS4 channel (400 hPa)
NOAA-15, USING ALL OBSERVATIONS

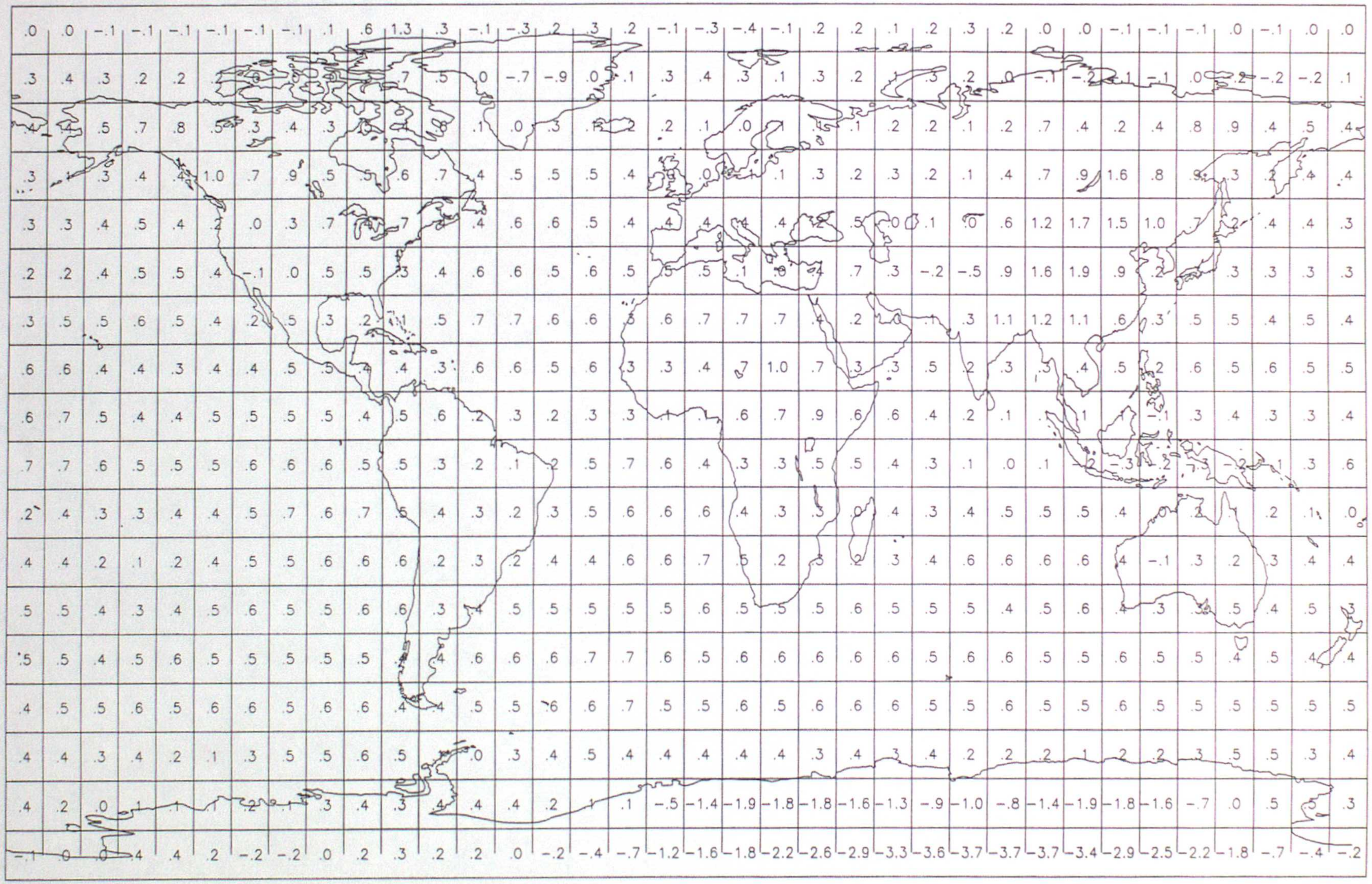
FIGURE 33



.5	.5	.6	.6	.6	.6	.6	.9	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.2	1.3	1.0	.8	.9	.7	.6	.5	.5	.5	.5	.5	.5	.6	.7	.5	.4
.8	1.1	1.3	1.2	1.2	1.2	.9	.9	[illegible]	[illegible]	.7	1.2	1.6	1.9	2.0	2.1	1.7	1.4	1.1	1.3	1.5	1.3	1.2	1.1	1.2	.8	.7	.8	.8	.6	.6	.6	.6	.7	.8	1.0
1.6	1.7	1.8	1.5	1.6	1.6	1.2	.9	.6	.7	.7	1.4	2.0	2.6	2.2	1.9	1.8	1.8	1.5	1.7	1.8	1.4	1.2	1.1	1.2	1.0	.9	1.0	1.1	.9	.8	1.1	1.0	1.1	1.4	1.8
1.4	1.3	1.1	1.1	1.4	1.2	1.2	.9	.7	.7	.9	1.3	2.0	2.6	2.1	1.8	1.8	[illegible]	2.0	1.5	1.1	.9	1.2	1.3	1.4	1.1	1.0	.8	.5	.6	1.0	1.4	.9	1.3	1.1	1.4
1.6	1.4	1.6	1.9	1.5	1.5	2.1	2.0	1.3	1.3	1.8	2.2	2.4	2.4	1.6	1.2	1.1	1.0	1.2	1.1	.8	1.1	1.5	1.5	1.1	1.1	1.0	1.1	.7	.6	.6	.9	.5	1.3	1.0	1.5
2.3	2.1	1.7	2.0	1.9	2.1	2.2	2.0	1.3	1.6	1.7	2.5	2.1	2.0	1.3	1.1	1.1	1.2	.9	.7	.7	1.0	1.6	1.7	1.4	1.3	1.2	1.1	.9	.8	.9	[illegible]	1.5	1.5	1.3	1.4
2.8	2.0	1.4	1.8	2.7	2.7	1.7	1.0	.6	.5	1.0	1.4	.7	.8	1.5	1.9	2.3	1.7	1.4	1.1	.8	.9	1.0	.9	.9	.7	.6	.6	.6	.6	.9	.8	.8	.8	.9	2.1
1.4	1.9	2.4	2.9	3.2	2.4	1.9	.7	.4	.4	.7	1.2	1.2	1.4	2.0	2.1	2.0	1.6	1.3	1.4	1.1	.6	.5	.6	.9	.9	1.7	1.7	1.8	2.1	2.7	2.1	1.7	1.5	2.0	2.0
1.9	1.0	1.3	2.0	2.6	2.4	1.3	.7	.7	1.4	2.4	3.2	3.2	3.0	3.2	3.3	3.9	4.4	4.3	4.4	4.3	1.4	.6	1.5	3.0	3.8	4.6	4.5	4.6	5.0	5.1	4.6	4.6	4.3	4.5	3.9
2.5	1.6	.8	.7	.7	.7	.4	.3	.5	1.3	4.2	4.8	4.8	4.6	2.6	1.5	1.0	1.8	3.8	5.9	6.0	4.2	1.4	2.9	3.3	4.7	5.4	4.8	5.5	5.4	3.4	5.6	5.9	5.4	4.7	4.2
5.5	4.5	3.8	3.3	2.2	1.4	.9	.5	.6	.8	3.3	5.2	5.2	4.3	2.4	.7	.3	.3	1.0	4.7	5.6	5.9	5.1	4.1	3.6	4.7	4.3	3.4	3.8	5.2	6.9	5.2	5.4	5.2	5.3	6.8
3.1	3.5	4.0	3.9	4.0	2.6	1.4	1.3	.8	.5	.8	4.7	4.5	3.4	2.7	1.5	.7	.5	.4	2.0	3.9	3.5	3.8	3.1	2.8	1.7	.8	.6	1.4	3.1	4.4	2.8	2.3	1.4	2.0	3.1
1.8	1.9	2.2	2.6	2.8	1.9	1.3	1.6	1.2	.6	.9	1.8	1.7	1.7	2.3	2.1	1.8	1.3	.9	1.1	1.4	1.6	1.3	1.5	2.1	1.9	1.3	1.2	.9	1.1	2.3	1.8	1.4	1.2	1.3	2.0
.8	.9	1.3	1.3	1.5	1.8	1.6	1.3	1.2	1.0	1.2	1.5	1.1	.9	1.0	1.1	1.3	1.6	1.5	1.4	1.3	1.7	1.6	1.4	1.4	1.3	1.5	1.4	1.2	1.0	1.1	1.4	1.2	1.0	1.1	1.3
1.0	1.0	.9	1.1	1.0	.9	1.1	1.0	1.0	.9	1.2	1.5	1.1	1.1	1.0	.9	.9	.8	.8	.9	1.0	1.1	1.2	1.1	1.1	1.2	1.1	1.1	1.1	1.0	1.2	1.0	.9	.9	.8	.9
.6	.6	.6	.7	.6	.7	.6	.7	.7	.6	.7	.7	.8	.7	.6	.6	.6	.5	.5	.6	.6	.6	.7	.7	.6	.6	.7	.7	.7	.7	.7	.7	.7	.7	.6	.6
.4	.4	.4	.5	.5	.4	.4	.4	.4	.4	.5	.6	.4	.3	.3	.4	.5	.4	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.4	.3
.3	.3	.4	.3	.3	.4	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.2	.2	.3	.4	.3

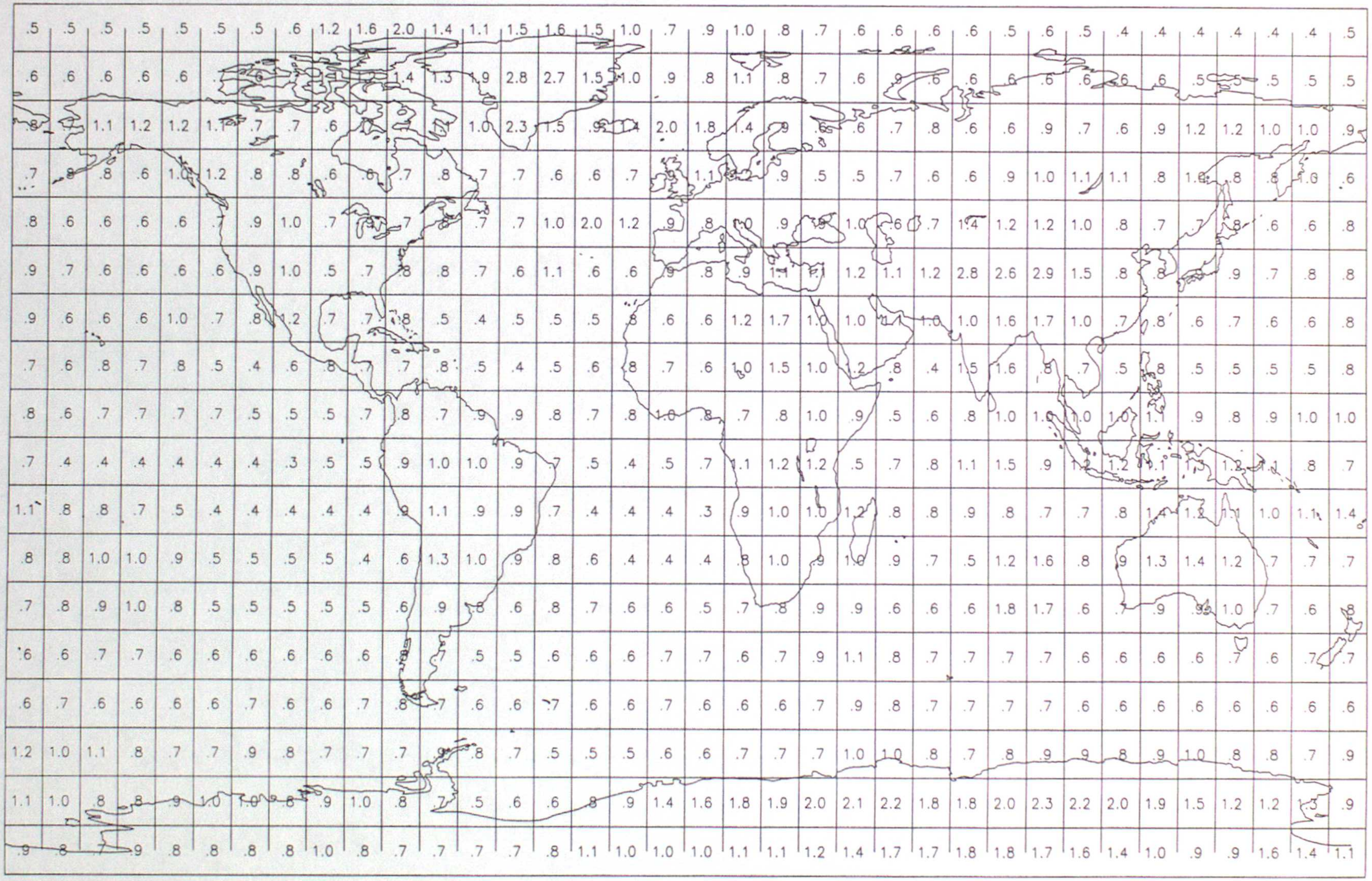
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
JANUARY 2000 : AMSUA-5 Channel (700 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 34

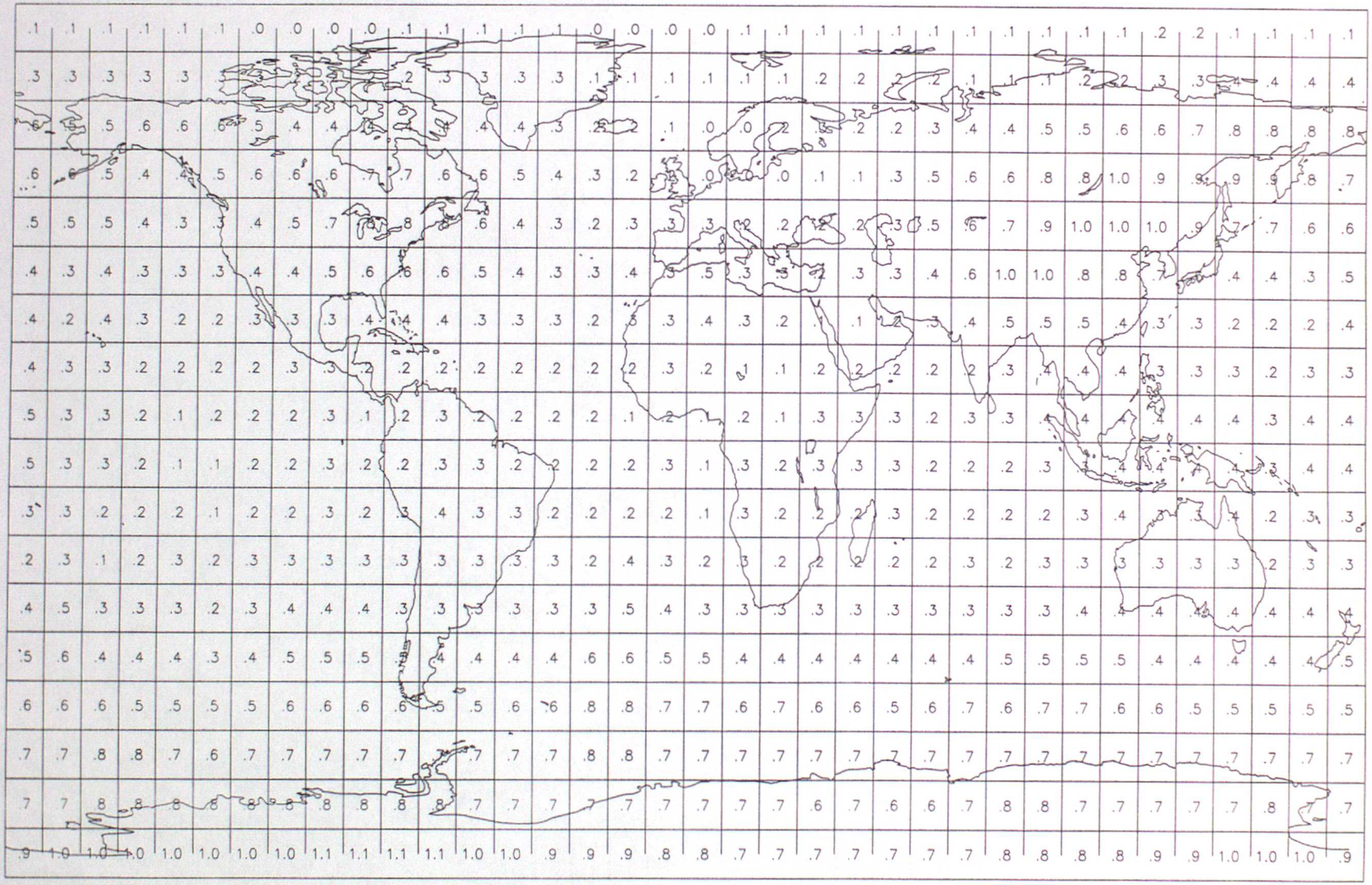

.0 .0 -.1 -.1 -.1 -.1 -.1 -.1 .1 .6 1.3 .3 -.1 -.3 .2 .3 .2 -.1 -.3 -.4 -.1 .2 .2 .1 .2 .3 .2 .0 .0 -.1 -.1 -.1 .0 -.1 .0 .0
.3 .4 .3 .2 .2 .2 .0 .0 [illegible] [illegible] .7 .5 .0 -.7 -.9 .0 .1 .3 .4 .3 .1 .3 .2 .1 .3 .2 .0 -.1 -.2 -.1 -.1 .0 .2 -.2 -.2 .1
.4 .4 .5 .7 .8 .5 .3 .4 .3 .3 [illegible] .8 .1 .0 .3 .1 .2 .2 .1 .0 .1 .1 .1 .2 .2 .1 .2 .7 .4 .2 .4 .8 .9 .4 .5 .4
.3 .1 .3 .4 .4 1.0 .7 .9 .5 .5 .6 .7 .4 .5 .5 .5 .4 [illegible] .0 .1 .1 .3 .2 .3 .2 .1 .4 .7 .9 1.6 .8 .9 .3 .2 .4 .4
.3 .3 .4 .5 .4 .2 .0 .3 .7 .4 .7 .4 .4 .6 .6 .5 .4 .4 .4 .4 .4 .2 .5 .0 .1 .0 .6 1.2 1.7 1.5 1.0 .7 .2 .4 .4 .3
.2 .2 .4 .5 .5 .4 -.1 .0 .5 .5 .3 .4 .6 .6 .5 .6 .5 .5 .5 .1 .0 .4 .7 .3 -.2 -.5 .9 1.6 1.9 .9 .2 [illegible] .3 .3 .3 .3
.3 .5 .5 .6 .5 .4 .2 .5 .3 .2 .1 .5 .7 .7 .6 .6 .3 .6 .7 .7 .7 .4 .2 .0 .1 .3 1.1 1.2 1.1 .6 .3 .5 .5 .4 .5 .4
.6 .6 .4 .4 .3 .4 .4 .5 .5 .4 .4 .3 .6 .6 .5 .6 .3 .3 .4 .7 1.0 .7 .3 .3 .5 .2 .3 .3 .4 .5 .2 .6 .5 .6 .5 .5
.6 .7 .5 .4 .4 .5 .5 .5 .5 .4 .5 .6 .2 .3 .2 .3 .3 .1 .1 .6 .7 .9 .6 .6 .4 .2 .1 .1 .1 .1 -.1 .3 .4 .3 .3 .4
.7 .7 .6 .5 .5 .5 .6 .6 .6 .5 .5 .3 .2 .1 .2 .5 .7 .6 .4 .3 .3 .5 .5 .4 .3 .1 .0 .1 -.2 -.3 -.2 -.3 -.2 .1 .3 .6
.2 .4 .3 .3 .4 .4 .5 .7 .6 .7 .5 .4 .3 .2 .3 .5 .6 .6 .6 .4 .3 .3 .0 .4 .3 .4 .5 .5 .5 .4 .0 .2 .1 .2 .1 .0
.4 .4 .2 .1 .2 .4 .5 .5 .6 .6 .6 .2 .3 .2 .4 .4 .6 .6 .7 .5 .2 .3 .2 .3 .4 .6 .6 .6 .6 .4 -.1 .3 .2 .3 .4 .4
.5 .5 .4 .3 .4 .5 .6 .5 .5 .6 .6 .3 .4 .5 .5 .5 .5 .5 .6 .5 .5 .5 .6 .5 .5 .5 .4 .5 .6 .4 .3 .3 .5 .4 .5 .3
.5 .5 .4 .5 .6 .5 .5 .5 .5 .5 .4 .4 .6 .6 .6 .7 .7 .6 .5 .6 .6 .6 .6 .6 .5 .6 .6 .5 .5 .6 .5 .5 .4 .5 .4 .4
.4 .5 .5 .6 .5 .6 .6 .5 .6 .6 .4 .4 .5 .5 .6 .6 .7 .5 .5 .6 .5 .6 .6 .6 .5 .5 .6 .5 .5 .6 .5 .5 .5 .5 .5 .5
.4 .4 .3 .4 .2 .1 .3 .5 .5 .6 .5 [illegible] .0 .3 .4 .5 .4 .4 .4 .4 .4 .3 .4 .3 .4 .2 .2 .2 .1 .2 .2 .3 .5 .5 .3 .4
.4 .2 .0 .1 .1 .1 .2 .1 .3 .4 .3 .4 .4 .4 .2 .1 .1 -.5 -1.4 -1.9 -1.8 -1.8 -1.6 -1.3 -.9 -1.0 -.8 -1.4 -1.9 -1.8 -1.6 -.7 .0 .5 .5 .3
-.1 .0 .0 .4 .4 .2 -.2 -.2 .0 .2 .3 .2 .2 .0 -.2 -.4 -.7 -1.2 -1.6 -1.8 -2.2 -2.6 -2.9 -3.3 -3.6 -3.7 -3.7 -3.7 -3.4 -2.9 -2.5 -2.2 -1.8 -.7 -.4 -.2

ATOVS : SD O–B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JANUARY 2000 : AMSUA–5 channel (700 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 35


.5 .5 .5 .5 .5 .5 .5 .6 1.2 1.6 2.0 1.4 1.1 1.5 1.6 1.5 1.0 .7 .9 1.0 .8 .7 .6 .6 .6 .6 .5 .6 .5 .4 .4 .4 .4 .4 .4 .5
.6 .6 .6 .6 .6 [illegible] .6 [illegible] [illegible] [illegible] 1.4 1.3 .9 2.8 2.7 1.5 1.0 .9 .8 1.1 .8 .7 .6 .9 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5
.8 .7 1.1 1.2 1.2 1.1 .7 .7 .6 [illegible] [illegible] 1.1 1.0 2.3 1.5 .9 1.4 2.0 1.8 1.4 .9 .6 .6 .7 .8 .6 .6 .9 .7 .6 .9 1.2 1.2 1.0 1.0 .9
.7 .8 .8 .6 1.0 1.2 .8 .8 .6 .6 .7 .8 .7 .7 .6 .6 .7 .9 1.1 1.2 .9 .5 .5 .7 .6 .6 .9 1.0 1.1 1.1 .8 1.0 .8 .8 1.0 .6
.8 .6 .6 .6 .6 .7 .9 1.0 .7 [illegible] .7 .8 .7 .7 1.0 2.0 1.2 .9 .8 1.0 .9 .9 1.0 .6 .7 1.4 1.2 1.2 1.0 .8 .7 .7 .8 .6 .6 .8
.9 .7 .6 .6 .6 .6 .9 1.0 .5 .7 .8 .8 .7 .6 1.1 .6 .6 .9 .8 .9 1.1 1.1 1.2 1.1 1.2 2.8 2.6 2.9 1.5 .8 .8 [illegible] .9 .7 .8 .8
.9 .6 .6 .6 1.0 .7 .8 1.2 .7 .7 .8 .5 .4 .5 .5 .5 .8 .6 .6 1.2 1.7 1.0 1.0 1.1 1.0 1.0 1.6 1.7 1.0 .7 .8 .6 .7 .6 .6 .8
.7 .6 .8 .7 .8 .5 .4 .6 .8 .7 .7 .8 .5 .4 .5 .6 .8 .7 .6 1.0 1.5 1.0 1.2 .8 .4 1.5 1.6 .8 .7 .5 .8 .5 .5 .5 .5 .8
.8 .6 .7 .7 .7 .7 .5 .5 .5 .7 .8 .7 .9 .9 .8 .7 .8 1.0 .8 .7 .8 1.0 .9 .5 .6 .8 1.0 1.0 1.0 1.0 1.1 .9 .8 .9 1.0 1.0
.7 .4 .4 .4 .4 .4 .4 .3 .5 .5 .9 1.0 1.0 .9 .7 .5 .4 .5 .7 1.1 1.2 1.2 .5 .7 .8 1.1 1.5 .9 1.2 1.2 1.1 1.3 1.2 1.1 .8 .7
1.1 .8 .8 .7 .5 .4 .4 .4 .4 .4 .9 1.1 .9 .9 .7 .4 .4 .4 .3 .9 1.0 1.0 1.2 .8 .8 .9 .8 .7 .7 .8 1.4 1.2 1.1 1.0 1.1 1.4
.8 .8 1.0 1.0 .9 .5 .5 .5 .5 .4 .6 1.3 1.0 .9 .8 .6 .4 .4 .4 .8 1.0 .9 1.0 .9 .7 .5 1.2 1.6 .8 .9 1.3 1.4 1.2 .7 .7 .7
.7 .8 .9 1.0 .8 .5 .5 .5 .5 .5 .6 .9 .8 .6 .8 .7 .6 .6 .5 .7 .8 .9 .9 .6 .6 .6 1.8 1.7 .6 .7 .9 .9 1.0 .7 .6 .8
.6 .6 .7 .7 .6 .6 .6 .6 .6 .6 .8 .7 .5 .5 .6 .6 .6 .7 .7 .6 .7 .9 1.1 .8 .7 .7 .7 .7 .6 .6 .6 .6 .7 .6 .7 .7
.6 .7 .6 .6 .6 .6 .7 .6 .6 .7 .8 .7 .6 .6 .7 .6 .6 .7 .6 .6 .6 .7 .9 .8 .7 .7 .7 .7 .6 .6 .6 .6 .6 .6 .6 .6
1.2 1.0 1.1 .8 .7 .7 .9 .8 .7 .7 .7 .9 .8 .7 .5 .5 .5 .6 .6 .7 .7 .7 1.0 1.0 .8 .7 .8 .9 .9 .8 .9 1.0 .8 .8 .7 .9
1.1 1.0 .8 .8 .9 1.0 1.0 .8 .9 1.0 .8 .7 .5 .6 .6 .8 .9 1.4 1.6 1.8 1.9 2.0 2.1 2.2 1.8 1.8 2.0 2.3 2.2 2.0 1.9 1.5 1.2 1.2 1.3 .9
.9 .8 .7 .9 .8 .8 .8 .8 1.0 .8 .7 .7 .7 .7 .8 1.1 1.0 1.0 1.0 1.1 1.1 1.2 1.4 1.7 1.7 1.8 1.8 1.7 1.6 1.4 1.0 .9 .9 1.6 1.4 1.1

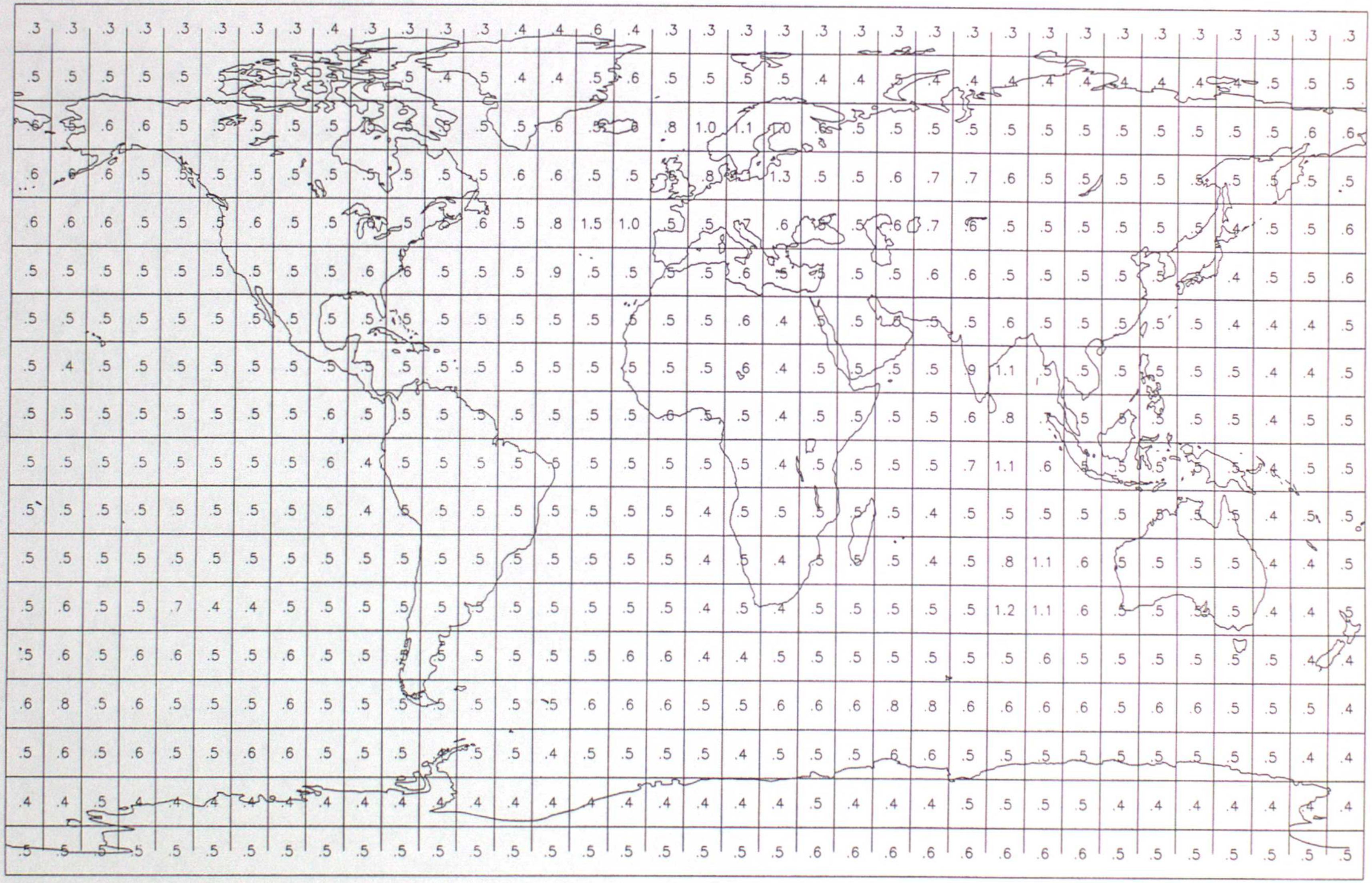
ATOVS : MEAN O-B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C) FIGURE 36
JANUARY 2000 : AMSUA-7 Channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS



.1	.1	.1	.1	.1	.1	.0	.0	.0	.0	.1	.1	.1	.1	.1	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2	.2	.1	.1	.1	.1
.3	.3	.3	.3	.3	.3	.3	[illegible]	[illegible]	[illegible]	.2	.3	.3	.3	.3	.1	.1	.1	.1	.1	.1	.2	.2	.2	.2	.1	.1	.1	.2	.2	.3	.3	.4	.4	.4	.4
.6	.5	.5	.6	.6	.6	.5	.4	.4	.4	.4	.4	.4	.4	.3	.2	.2	.1	.0	.0	.2	.3	.2	.2	.3	.4	.4	.5	.5	.6	.6	.7	.8	.8	.8	.8
.6	.6	.5	.4	.4	.5	.6	.6	.6	.7	.7	.6	.6	.5	.4	.3	.2	[illegible]	.0	.0	.0	.1	.1	.3	.5	.6	.6	.8	.8	1.0	.9	.9	.9	.9	.8	.7
.5	.5	.5	.4	.3	.3	.4	.5	.7	.8	.8	.8	.6	.4	.3	.2	.3	.3	.3	.2	.2	.2	.2	.3	.5	.6	.7	.9	1.0	1.0	1.0	.9	.7	.7	.6	.6
.4	.3	.4	.3	.3	.3	.4	.4	.5	.6	.6	.6	.5	.4	.3	.3	.4	.3	.5	.3	.3	.2	.3	.3	.4	.6	1.0	1.0	.8	.8	.7	[illegible]	.4	.4	.3	.5
.4	.2	.4	.3	.2	.2	.3	.3	.3	.4	.4	.4	.3	.3	.3	.2	.3	.3	.4	.3	.2	.1	.1	.2	.3	.4	.5	.5	.5	.4	.3	.3	.2	.2	.2	.4
.4	.3	.3	.2	.2	.2	.2	.3	.3	.2	.2	.2	.2	.2	.2	.2	.2	.3	.2	.1	.1	.2	.2	.2	.2	.2	.3	.4	.4	.4	.3	.3	.3	.2	.3	.3
.5	.3	.3	.2	.1	.2	.2	.2	.3	.1	.2	.3	.2	.2	.2	.2	.1	.2	.1	.2	.1	.3	.3	.3	.2	.3	.3	.4	.4	.4	.4	.4	.4	.3	.4	.4
.5	.3	.3	.2	.1	.1	.2	.2	.3	.2	.2	.3	.3	.2	.2	.2	.2	.3	.1	.3	.2	.3	.3	.3	.2	.2	.2	.3	.3	.4	.4	.4	.4	.3	.4	.4
.3	.3	.2	.2	.2	.1	.2	.2	.3	.2	.3	.4	.3	.3	.2	.2	.2	.2	.1	.3	.2	.2	.2	.3	.2	.2	.2	.2	.3	.4	.3	.3	.4	.2	.3	.3
.2	.3	.1	.2	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.2	.4	.3	.2	.3	.2	.2	.2	.2	.2	.3	.2	.3	.3	.3	.3	.3	.3	.2	.3	.3
.4	.5	.3	.3	.3	.2	.3	.4	.4	.4	.3	.3	.3	.3	.3	.3	.5	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4
.5	.6	.4	.4	.4	.3	.4	.5	.5	.5	.5	.4	.4	.4	.4	.6	.6	.5	.5	.4	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.4	.4	.4	.4	.4	.5
.6	.6	.6	.5	.5	.5	.5	.6	.6	.6	.6	.5	.5	.6	.6	.8	.8	.7	.7	.6	.7	.6	.6	.5	.6	.7	.6	.7	.7	.6	.6	.5	.5	.5	.5	.5
.7	.7	.8	.8	.7	.6	.7	.7	.7	.7	.7	.7	.7	.7	.7	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.6	.7	.6	.6	.7	.8	.8	.7	.7	.7	.7	.7	.8	.7
.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0	1.0	.9	.9	.9	.8	.8	.7	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.9	.9	1.0	1.0	1.0	.9

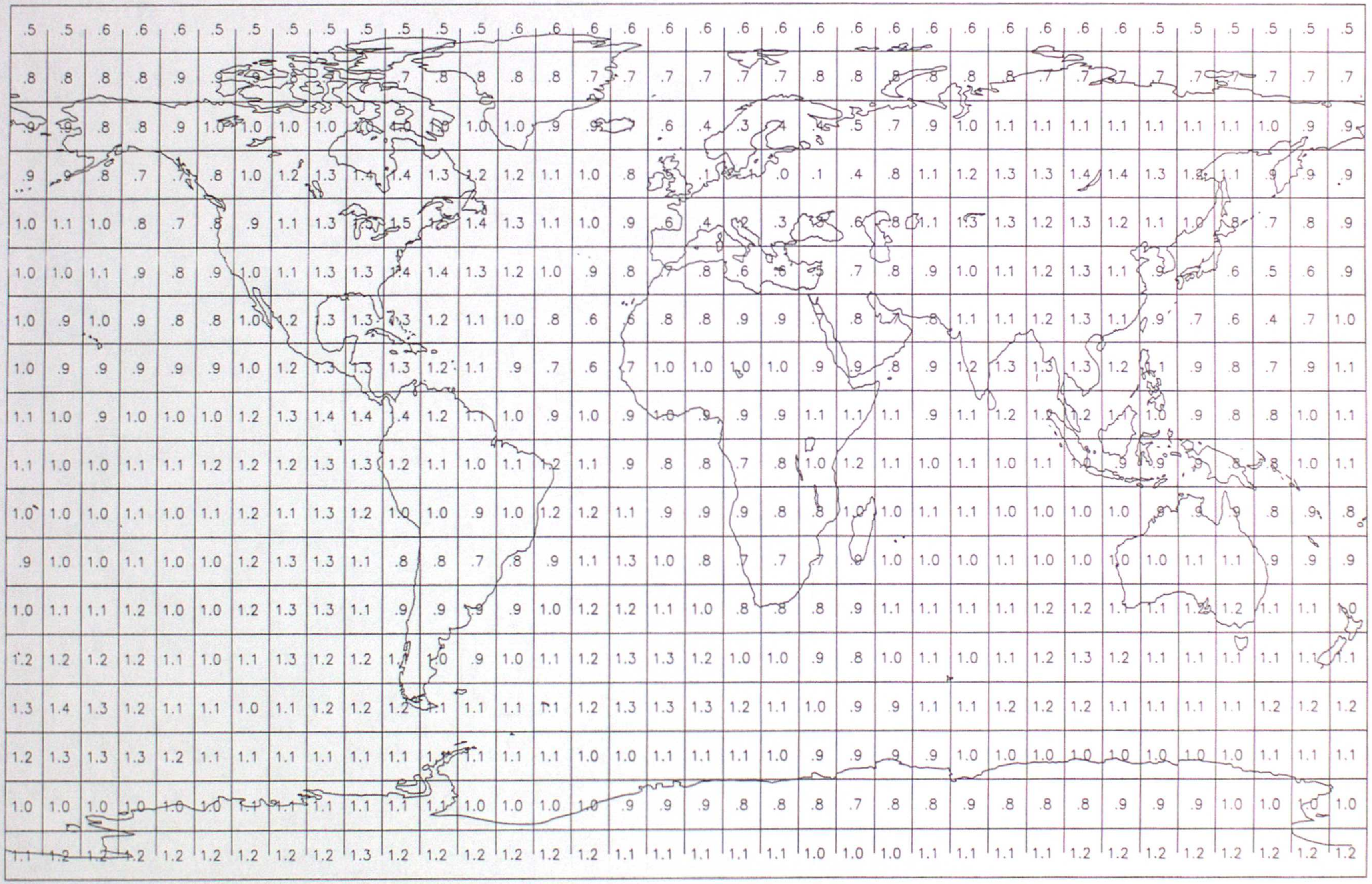
ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JANUARY 2000 : AMSUA-7 channel (300 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 37


.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .6 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .4 .5 .4 .4 .5 .6 .5 .5 .5 .5 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5
.6 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .8 .8 1.0 1.1 1.0 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6
.6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .6 .8 1.1 1.3 .5 .5 .6 .7 .7 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5
.6 .6 .6 .5 .5 .5 .6 .5 .5 .6 .5 .6 .5 .8 1.5 1.0 .5 .5 .7 .6 .5 .5 .6 .7 .6 .5 .5 .5 .5 .5 .5 .4 .5 .5 .6
.5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .5 .5 .5 .9 .5 .5 .5 .5 .6 .5 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .4 .5 .5 .6
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .4 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .4 .4 .4 .5
.5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .4 .5 .5 .5 .5 .9 1.1 .5 .5 .5 .5 .5 .5 .4 .4 .5
.5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .4 .5 .5 .5 .5 .6 .8 .7 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .6 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .7 1.1 .6 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .5
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .4 .5 .8 1.1 .6 .5 .5 .5 .5 .4 .4 .5
.5 .6 .5 .5 .7 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .5 .4 .5 .5 .5 .5 .5 1.2 1.1 .6 .5 .5 .5 .5 .4 .4 .5
.5 .6 .5 .6 .6 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .4 .4 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .4 .4
.6 .8 .5 .6 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .6 .6 .6 .8 .8 .6 .6 .6 .6 .5 .6 .6 .5 .5 .5 .4
.5 .6 .5 .6 .5 .5 .6 .6 .5 .5 .5 .4 .5 .5 .4 .5 .5 .5 .5 .4 .5 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4
.4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5

ATOVS : MEAN O–B BRIGHTNESS TEMPERATURE DIFFERENCES (DEG C)
JANUARY 2000 : AMSUA–9 Channel (100 hPa)
NOAA–15, USING ALL OBSERVATIONS

FIGURE 38



.5	.5	.6	.6	.6	.5	.5	.5	.5	.5	.5	.5	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.5	.5	.5	.5
.8	.8	.8	.8	.9	.9	.9	[illegible]	[illegible]	[illegible]	.7	.8	.8	.8	.8	.7	.7	.7	.7	.7	.7	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7
.9	.9	.8	.8	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	[illegible]	.6	.4	.3	.4	.4	.5	.7	.9	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	.9	.9
.9	.9	.8	.7	.7	.8	1.0	1.2	1.3	1.4	1.4	1.3	1.2	1.2	1.1	1.0	.8	.5	.1	.1	.0	.1	.4	.8	1.1	1.2	1.3	1.3	1.4	1.4	1.3	1.2	1.1	.9	.9	.9
1.0	1.1	1.0	.8	.7	.8	.9	1.1	1.3	1.5	1.5	1.5	1.4	1.3	1.1	1.0	.9	.6	.4	.2	.3	.3	.6	.8	1.1	1.3	1.3	1.2	1.3	1.2	1.1	1.0	.8	.7	.8	.9
1.0	1.0	1.1	.9	.8	.9	1.0	1.1	1.3	1.3	1.4	1.4	1.3	1.2	1.0	.9	.8	.7	.8	.6	.6	.5	.7	.8	.9	1.0	1.1	1.2	1.3	1.1	.9	[illegible]	.6	.5	.6	.9
1.0	.9	1.0	.9	.8	.8	1.0	1.2	1.3	1.3	1.3	1.2	1.1	1.0	.8	.6	.6	.8	.8	.9	.9	[illegible]	.8	.7	.8	1.1	1.1	1.2	1.3	1.1	.9	.7	.6	.4	.7	1.0
1.0	.9	.9	.9	.9	.9	1.0	1.2	1.3	1.3	1.3	1.2	1.1	.9	.7	.6	.7	1.0	1.0	1.0	1.0	.9	.9	.8	.9	1.2	1.3	1.3	1.3	1.2	1.1	.9	.8	.7	.9	1.1
1.1	1.0	.9	1.0	1.0	1.0	1.2	1.3	1.4	1.4	1.4	1.2	1.1	1.0	.9	1.0	.9	1.0	.9	.9	.9	1.1	1.1	1.1	.9	1.1	1.2	1.2	1.2	1.1	1.0	.9	.8	.8	1.0	1.1
1.1	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.2	1.1	1.0	1.1	1.2	1.1	.9	.8	.8	.7	.8	1.0	1.2	1.1	1.0	1.1	1.0	1.1	1.0	.9	.9	.9	.8	.8	1.0	1.1
1.0	1.0	1.0	1.1	1.0	1.1	1.2	1.1	1.3	1.2	1.0	1.0	.9	1.0	1.2	1.2	1.1	.9	.9	.9	.8	.8	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	.8	.9	.9	.8	.9	.8
.9	1.0	1.0	1.1	1.0	1.0	1.2	1.3	1.3	1.1	.8	.8	.7	.8	.9	1.1	1.3	1.0	.8	.7	.7	.7	.9	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.1	1.1	.9	.9	.9
1.0	1.1	1.1	1.2	1.0	1.0	1.2	1.3	1.3	1.1	.9	.9	.9	1.0	1.2	1.2	1.1	1.0	.8	.8	.8	.9	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.2	1.2	1.1	1.1	1.0
1.2	1.2	1.2	1.2	1.1	1.0	1.1	1.3	1.2	1.2	1.1	1.0	.9	1.0	1.1	1.2	1.3	1.3	1.2	1.0	1.0	.9	.8	1.0	1.1	1.0	1.1	1.2	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1
1.3	1.4	1.3	1.2	1.1	1.1	1.0	1.1	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.2	1.3	1.3	1.3	1.2	1.1	1.0	.9	.9	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.2
1.2	1.3	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.0	.9	.9	.9	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1
1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	.9	.9	.9	.8	.8	.8	.7	.8	.8	.9	.8	.8	.8	.9	.9	.9	1.0	1.0	1.0	1.0
1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

ATOVS : SD O-B BRIGHTNESS TEMPERATURE DIFFERENCES(DEG C)
JANUARY 2000 : AMSUA-9 channel (100 hPa)
NOAA-15, USING ALL OBSERVATIONS

FIGURE 39

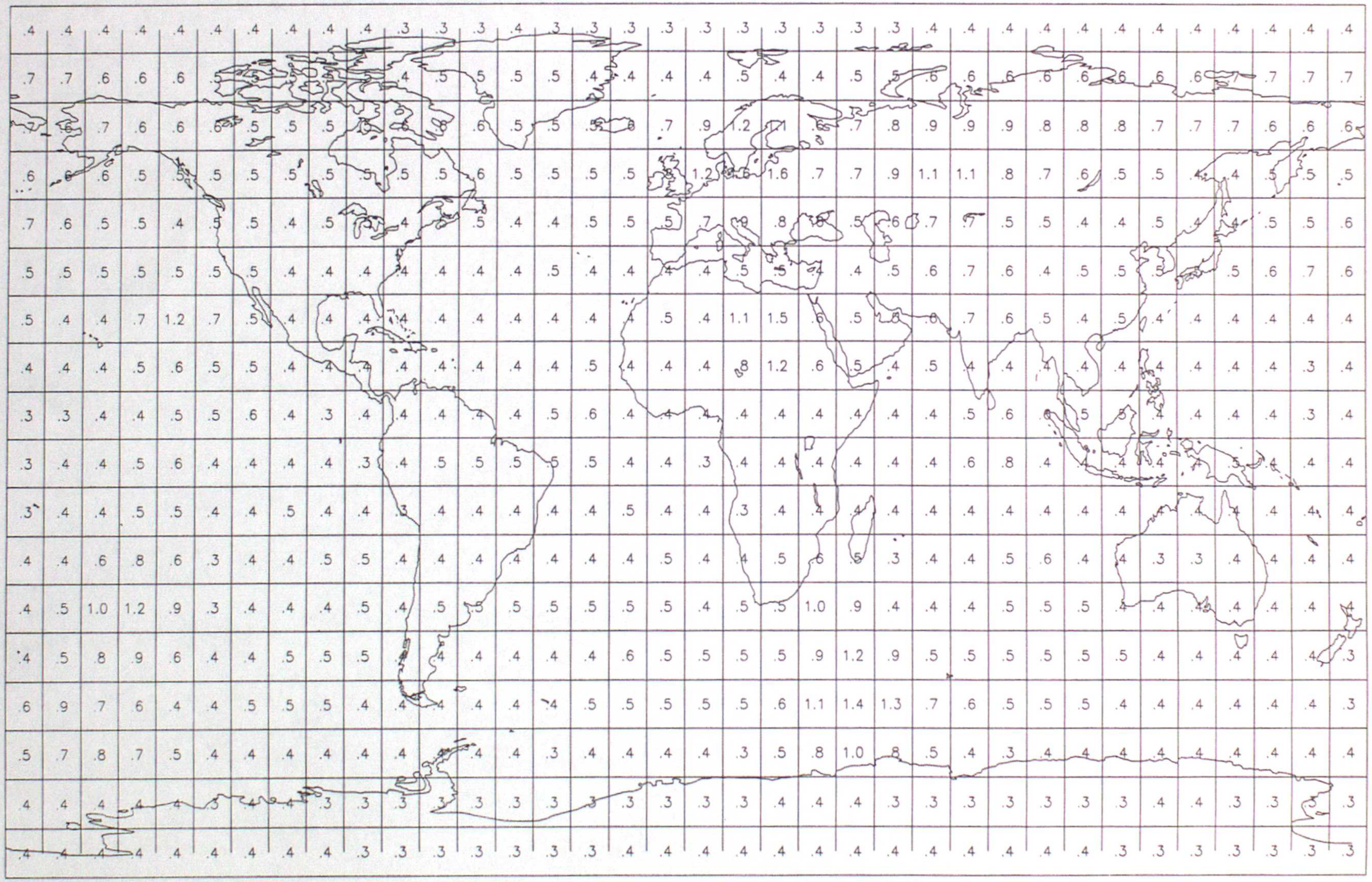


TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
03728	61.7	-11.2	ALL	P	SUR	1	1	100			
27882	45.2	-83.2	ALL	P	SUR	1	0	0	0.0	5.6	5.6
41520	23.5	-59.1	ALL	P	SUR	276	1	0	1.1	-0.5	1.2
41521	24.9	-69.0	ALL	P	SUR	286	0	0	0.8	0.0	0.8
41524	18.2	-72.1	ALL	P	SUR	194	0	0	1.1	-0.3	1.1
41528	34.0	-60.0	ALL	P	SUR	305	0	0	1.0	0.2	1.1
41599	28.6	-38.7	ALL	P	SUR	1439	47	3	1.0	-1.0	1.4
41625	27.2	-74.0	ALL	P	SUR	268	0	0	1.0	0.1	1.0
41630	19.4	-48.0	ALL	P	SUR	272	0	0	1.3	0.0	1.3
41641	18.9	-57.7	ALL	P	SUR	210	0	0	0.9	0.6	1.1
41644	25.0	-49.8	ALL	P	SUR	273	0	0	0.9	-0.2	0.9
41651	29.7	-77.3	ALL	P	SUR	298	0	0	1.3	0.4	1.4
41671	26.8	-71.9	ALL	P	SUR	302	0	0	1.0	0.4	1.0
41853	35.1	-68.4	ALL	P	SUR	277	0	0	3.3	4.8	5.8
42558	47.5	-57.4	ALL	P	SUR	1	0	0	0.0	-2.8	2.8
44513	45.3	-46.2	ALL	P	SUR	54	10	19	6.7	-1.3	6.8
44516	47.4	-32.4	ALL	P	SUR	217	71	33	2.8	0.8	2.9
44517	48.4	-31.8	ALL	P	SUR	128	128	100			
44546	39.4	-28.2	ALL	P	SUR	1465	0	0	0.9	0.5	1.1
44607	51.7	-35.4	ALL	P	SUR	654	0	0	2.2	1.1	2.5
44608	39.5	-14.5	ALL	P	SUR	1711	0	0	0.9	-0.1	0.9
44610	56.5	-35.2	ALL	P	SUR	1594	6	0	2.2	0.0	2.2
44613	28.2	-34.5	ALL	P	SUR	972	8	1	1.2	-0.4	1.3
44614	50.2	-15.1	ALL	P	SUR	1061	10	1	1.6	-0.2	1.7
44621	50.5	-10.1	ALL	P	SUR	1184	15	1	1.3	-0.2	1.3
44625	49.9	-7.6	ALL	P	SUR	1766	9	1	1.1	0.1	1.1
44626	47.5	-35.1	ALL	P	SUR	1361	11	1	1.7	-0.3	1.7
44627	43.3	-36.4	ALL	P	SUR	1262	6	0	1.3	0.0	1.3
44628	39.8	-44.5	ALL	P	SUR	1134	8	1	1.5	0.3	1.5
44630	46.2	-23.5	ALL	P	SUR	1369	7	1	1.1	-0.1	1.1
44721	58.1	-20.3	ALL	P	SUR	1930	11	1	2.2	-0.7	2.3
44722	54.5	-27.4	ALL	P	SUR	1765	8	0	1.9	-0.7	2.1
44723	45.0	-37.2	ALL	P	SUR	609	3	0	1.9	0.2	1.9
44765	30.0	-55.8	ALL	P	SUR	492	4	1	1.1	-0.5	1.2
44766	54.6	-10.3	ALL	P	SUR	1437	14	1	2.2	-0.5	2.3
44773	63.5	-19.7	ALL	P	SUR	1034	2	0	3.2	-0.7	3.2
44777	56.7	-35.4	ALL	P	SUR	1756	20	1	2.0	-0.7	2.1
44842	42.5	-64.0	ALL	P	SUR	1	0	0	0.0	-1.3	1.3
44855	47.3	-57.4	ALL	P	SUR	1	0	0	0.0	-6.5	6.5
47553	67.9	-59.4	ALL	P	SUR	428	0	0	2.4	0.3	2.4
62507	41.5	-24.7	ALL	P	SUR	1226	10	1	1.0	-0.2	1.0
62508	43.3	-14.6	ALL	P	SUR	1203	6	0	1.4	-0.6	1.5
62509	46.4	-8.7	ALL	P	SUR	1137	3	0	1.3	0.0	1.3
62510	48.9	-10.4	ALL	P	SUR	504	6	1	6.1	-4.2	7.4
62520	31.0	-29.7	ALL	P	SUR	985	0	0	1.1	-0.6	1.2
62554	34.1	-14.0	ALL	P	SUR	99	99	100			
62596	55.0	-28.1	ALL	P	SUR	617	11	2	2.3	0.4	2.3
62597	53.3	-30.3	ALL	P	SUR	294	0	0	1.3	-0.1	1.3
62673	44.7	-63.6	ALL	P	SUR	14	0	0	1.4	-6.9	7.0
62703	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	0.0	0.0
62825	53.8	-3.5	ALL	P	SUR	1	0	0	0.0	0.7	0.7
64516	66.3	-54.5	ALL	P	SUR	1334	47	4	5.2	1.0	5.3
64517	56.6	-41.2	ALL	P	SUR	1288	4	0	2.6	-0.5	2.6
64518	57.2	-19.2	ALL	P	SUR	1284	0	0	1.9	-0.9	2.1
64530	62.2	-19.5	ALL	P	SUR	1351	17	1	2.5	-0.9	2.6
64546	63.5	-21.3	ALL	P	SUR	1241	6	0	3.0	-0.8	3.1
64547	62.7	-21.4	ALL	P	SUR	1430	12	1	2.6	-0.8	2.7
64698	59.6	-46.4	ALL	P	SUR	1029	56	5	2.5	-0.4	2.6
64699	62.8	-54.8	ALL	P	SUR	1017	5	0	2.8	1.0	3.0
65594	64.5	-33.9	ALL	P	SUR	1032	73	7	2.5	-0.2	2.5

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
65595	62.2	-12.8	ALL	P	SUR	1734	27	2	2.4	-1.1	2.6
65596	62.8	-14.7	ALL	P	SUR	1160	1	0	2.5	-1.0	2.7
65598	61.4	-31.9	ALL	P	SUR	1386	12	1	2.8	-1.3	3.1
65599	61.4	-32.3	ALL	P	SUR	2118	11	1	2.2	-0.3	2.3
65600	62.8	-24.8	ALL	P	SUR	1467	0	0	2.6	-0.6	2.6
WIND SPEED											
41520	23.5	-59.1	ALL	SPEED	SUR	9	0	0	3.4	3.1	4.6
41521	24.9	-69.0	ALL	SPEED	SUR	279	0	0	1.4	-0.7	1.6
41625	27.2	-74.0	ALL	SPEED	SUR	247	0	0	1.9	-1.6	2.5
41630	19.4	-48.0	ALL	SPEED	SUR	267	0	0	2.6	1.0	2.8
41641	18.9	-57.7	ALL	SPEED	SUR	206	0	0	1.9	0.3	1.9
41644	25.0	-49.8	ALL	SPEED	SUR	2	0	0	0.5	-8.5	8.5
41651	29.7	-77.3	ALL	SPEED	SUR	29	0	0	2.9	2.9	4.1
44607	51.7	-35.4	ALL	SPEED	SUR	639	0	0	3.2	0.5	3.2
44721	58.1	-20.3	ALL	SPEED	SUR	1507	0	0	2.8	-0.8	2.9
44773	63.5	-19.7	ALL	SPEED	SUR	445	0	0	3.7	0.0	3.7
44777	56.7	-35.4	ALL	SPEED	SUR	1330	0	0	2.4	-1.7	3.0
62506	37.9	-20.2	ALL	SPEED	SUR	646	0	0	2.3	0.9	2.5
62508	43.3	-14.6	ALL	SPEED	SUR	977	0	0	1.7	0.1	1.7
62510	48.9	-10.4	ALL	SPEED	SUR	632	0	0	2.6	1.5	3.0
62597	53.3	-30.3	ALL	SPEED	SUR	259	0	0	2.4	-2.4	3.3
62703	49.9	-2.9	ALL	SPEED	SUR	1	0	0	0.0	0.6	0.6
62708	50.1	-6.7	ALL	SPEED	SUR	1	0	0	0.0	2.5	2.5
62807	50.1	-6.1	ALL	SPEED	SUR	1	0	0	0.0	4.0	4.0
WIND DIRECTION											
41520	23.5	-59.1	ALL	DIRN.	SUR	6	0	0	10.4	-17.3	20.2
41521	24.9	-69.0	ALL	DIRN.	SUR	201	0	0	15.9	-13.6	20.9
41625	27.2	-74.0	ALL	DIRN.	SUR	149	0	0	19.0	10.2	21.6
41630	19.4	-48.0	ALL	DIRN.	SUR	215	0	0	14.5	17.4	22.7
41641	18.9	-57.7	ALL	DIRN.	SUR	161	0	0	12.9	18.9	22.9
41651	29.7	-77.3	ALL	DIRN.	SUR	23	0	0	16.2	-12.5	20.4
44607	51.7	-35.4	ALL	DIRN.	SUR	594	0	0	22.1	3.8	22.4
44721	58.1	-20.3	ALL	DIRN.	SUR	1169	0	0	20.0	10.5	22.6
44773	63.5	-19.7	ALL	DIRN.	SUR	337	0	0	25.7	1.9	25.8
44777	56.7	-35.4	ALL	DIRN.	SUR	1216	0	0	17.8	7.9	19.5
62506	37.9	-20.2	ALL	DIRN.	SUR	430	0	0	19.3	-8.7	21.1
62508	43.3	-14.6	ALL	DIRN.	SUR	726	0	0	20.4	0.1	20.4
62510	48.9	-10.4	ALL	DIRN.	SUR	546	0	0	18.6	-3.8	19.0
62597	53.3	-30.3	ALL	DIRN.	SUR	186	0	0	36.4	2.8	36.5
62703	49.9	-2.9	ALL	DIRN.	SUR	1	0	0	0.0	-22.7	22.7
62708	50.1	-6.7	ALL	DIRN.	SUR	1	0	0	0.0	-7.0	7.0
62807	50.1	-6.1	ALL	DIRN.	SUR	1	0	0	0.0	-32.0	32.0

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3492	1	4	1.5	0.0	3486	0	5	0	9.3	0.7
ACA	1554	0	3	2.0	0.1	1585	0	3	0	8.4	1.0
AEA	118	2	7	2.2	0.7	116	0	7	0	10.0	0.0
AEL	408	1	41	2.0	-1.0	421	0	18	0	9.9	0.5
AEY	60	2	8	2.1	0.5	63	0	10	0	11.2	-0.3
AFL	409	1	3	1.9	0.3	414	1	5	0	10.9	0.6
AFR	1233	0	7	1.8	0.0	1274	0	8	0	8.4	0.7
AIH	205	2	7	1.9	-0.3	212	0	6	0	9.4	1.2
AJM	74	1	7	2.4	-0.1	74	0	1	0	6.9	0.6
AMM	142	0	7	1.5	0.3	149	1	11	0	9.4	0.3
AMX	210	3	5	2.1	0.1	209	1	6	0	10.9	0.7
ANZ	177	1	21	2.4	-1.5	180	0	20	0	8.9	0.7
AOM	487	1	5	1.6	0.3	501	0	5	0	8.3	0.9
AVA	190	0	5	1.9	0.0	201	0	5	0	8.4	0.2
AZA	445	1	33	2.1	0.4	443	0	5	0	9.2	1.2
BAF	22	0	5	2.2	-1.2	22	0	0	0	6.3	0.7
BAL	166	2	16	1.6	-0.1	176	0	14	0	7.8	1.5
BAW	1404	0	8	1.9	-0.1	1417	0	9	0	8.3	0.9
BBB	41	2	5	2.2	0.1	39	0	0	0	8.4	0.2
BLX	30	0	0	2.1	-0.8	30	0	0	0	11.0	2.5
BWA	45	0	2	2.5	1.6	49	0	6	0	11.4	0.6
CDN	732	0	4	1.7	0.0	735	0	6	0	9.8	0.8
CFC	28	0	4	1.9	0.6	27	0	4	0	7.1	1.6
CFG	705	0	2	1.7	-0.9	720	0	3	0	8.7	0.2
CKS	21	0	0	2.0	-0.6	20	0	0	0	6.3	0.8
CKT	73	0	3	1.6	0.9	77	4	12	0	9.9	-0.2
CLX	216	1	4	1.9	-0.6	218	0	3	0	7.9	0.6
CMM	107	1	6	2.8	1.0	108	0	4	0	9.0	2.6
COA	644	1	3	1.7	-0.2	662	0	10	0	13.2	1.6
CRL	355	2	5	1.8	0.6	361	0	4	0	8.8	1.0
CTB	105	0	2	1.8	-0.3	103	0	3	0	9.7	1.1
CUB	215	0	4	1.8	1.0	221	0	6	0	9.5	0.2
DAL	1632	0	16	1.7	-0.5	1657	0	17	0	10.1	0.7
DBY	286	0	3	1.7	-0.6	286	0	6	0	9.5	0.4
DCS	40	0	8	1.7	-0.2	40	0	10	0	9.5	0.7
DLH	1861	0	4	1.7	-0.1	1875	0	5	0	8.9	0.9
EEZ	157	3	86	3.8	2.1	159	1	18	0	10.2	1.6
EIN	22	0	0	1.9	-0.9	23	0	0	0	6.4	1.1
ELY	119	3	5	1.7	-0.1	126	0	5	0	10.1	-0.4
ETH	36	0	11	1.0	0.1	37	0	11	0	7.5	1.5
EWW	35	20	23	1.0	0.4	34	0	6	0	10.3	1.5
FDX	429	1	8	1.8	0.3	438	0	10	0	11.6	-0.2
FIN	395	0	3	1.5	0.2	399	1	5	0	9.4	0.4
GAF	43	0	9	2.2	0.1	42	0	7	0	9.2	0.7
GCO	38	3	8	1.2	0.1	44	2	20	0	16.0	2.9
GRL	45	0	2	1.9	-0.1	46	0	2	0	6.4	1.5
GTI	63	2	8	1.7	-0.7	64	0	13	0	11.9	1.2
HBI	20	0	0	2.4	0.4	21	0	10	0	9.8	0.0
HLF	60	0	5	1.9	-0.6	60	3	7	0	7.5	-0.2
IBE	1306	0	11	2.0	0.4	1298	0	13	0	10.3	1.3
ICE	1256	0	3	1.6	-0.1	1257	0	4	0	8.7	1.1
IWD	28	0	0	1.2	-0.6	27	0	0	0	6.7	0.6
JKK	179	0	9	1.8	-0.1	170	1	10	0	8.5	1.8
KLM	2164	0	8	1.8	0.3	2184	0	9	0	8.9	0.7
LDA	84	1	19	2.1	-0.2	86	1	17	0	8.4	1.6
LDI	572	1	100	3.1	0.4	592	0	14	0	9.2	0.7
LIB	172	1	1	1.4	0.8	176	0	1	0	7.4	0.7
LOT	180	1	4	2.2	-0.8	179	1	6	0	10.9	0.0
LTU	425	0	5	1.9	-0.2	434	0	5	0	7.9	1.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
MAS	51	0	4	1.8	0.5	51	0	4	0	8.4	1.2
MON	94	0	2	2.1	0.1	94	0	0	0	7.4	1.7
MPD	106	1	7	1.9	-0.1	105	1	11	0	13.0	1.8
MPH	475	1	4	1.7	-0.6	489	1	6	0	9.6	0.7
NCA	33	0	0	1.6	-0.2	33	0	3	0	8.7	0.0
NVR	45	0	4	2.2	0.1	45	0	4	0	9.6	1.4
NWA	2658	0	2	1.7	0.5	2595	1	4	0	9.5	0.6
OAL	26	4	8	2.1	0.9	27	0	0	0	7.8	2.1
PAC	93	1	27	1.7	0.1	94	1	4	0	8.6	0.4
RAM	58	2	2	2.1	-0.5	58	0	2	0	7.1	0.0
RCH	77	3	8	2.2	0.9	76	1	9	0	9.0	2.4
RJA	35	3	3	1.3	-0.5	34	0	3	0	7.9	1.5
RRR	101	2	16	2.2	-0.7	101	0	16	0	11.2	1.2
RZO	24	0	0	0.9	-0.2	24	0	8	0	11.7	2.3
SAB	43	0	5	1.7	0.3	44	0	2	0	5.9	2.3
SAS	1520	0	6	1.6	-0.4	1521	0	7	0	9.0	0.7
SIA	142	1	7	1.9	-1.1	142	0	9	0	9.9	0.6
SLR	140	0	15	1.9	-1.3	142	0	15	0	8.1	0.0
SNB	62	0	0	1.9	0.5	65	0	8	0	11.6	-0.3
SVA	151	2	4	1.8	-0.2	157	0	5	0	10.0	0.1
SWR	110	0	5	1.8	-0.2	114	0	5	0	8.8	1.4
TAP	269	1	4	1.6	-0.2	274	0	6	0	9.6	1.2
TCU	24	0	0	1.2	-0.7	25	0	0	0	6.6	1.3
THY	22	0	9	1.5	-0.2	22	0	14	0	12.4	-0.3
TOW	103	0	1	1.8	0.4	103	1	8	0	10.2	1.7
TPA	23	0	0	1.0	0.4	25	0	0	0	5.3	-0.2
TSC	20	0	0	0.7	0.2	20	0	15	0	19.0	1.8
TWA	1010	0	3	2.0	0.0	946	0	3	0	8.1	1.2
UAL	1908	0	6	1.9	-0.3	1960	0	6	0	8.6	1.0
UPS	615	1	12	2.3	0.9	631	0	12	0	8.8	0.5
USA	332	1	5	2.2	0.0	275	0	7	0	9.6	0.7
VIR	633	0	3	1.8	-0.2	637	0	3	0	7.9	0.9
VKG	143	1	3	2.3	-0.7	145	0	3	0	7.4	1.2
WOA	31	0	6	1.2	0.1	35	0	9	0	8.7	2.0
BA	2523	0	8	1.4	0.3	2515	0	8	0	7.4	1.5
EU	8023	0	18	1.4	-0.2	8023	0	18	0	7.0	0.6
KL	3401	0	7	1.4	0.6	3394	0	8	0	7.7	1.1
LH	73	0	5	1.8	1.0	73	0	5	0	7.1	2.9
N	367	1	5	2.5	-0.1	378	1	7	0	11.0	1.6
US ACARS	14078	0	23	1.6	0.5	14078	0	19	0	7.5	0.9

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	100	8	0	11.3	33.7	31.8
ELML7	12	Z	100	11	0	7.9	32.2	31.2
FNOR	00	Z	100	9	0	15.9	44.1	41.1
FNOR	12	Z	100	10	0	12.9	36.7	34.3
FNOU	00	Z	100	12	0	21.1	35.4	28.5
FNOU	12	Z	100	15	0	10.9	21.2	18.2
FNPH	00	Z	100	11	0	18.2	42.4	38.3
FNPH	12	Z	100	10	0	17.2	29.9	24.4
FNRS	00	Z	100	11	0	17.4	37.0	32.6
FNRS	12	Z	100	13	0	10.9	26.7	24.3
LDWR	00	Z	100	27	0	36.7	40.9	-18.0
LDWR	12	Z	100	27	0	16.0	17.2	-6.1
OVYA2	00	Z	100	9	0	21.5	21.7	-2.6
OVYA2	12	Z	100	12	0	22.8	22.9	1.6
OXTS2	00	Z	100	17	0	17.4	19.9	-9.6
OXTS2	12	Z	100	15	0	13.6	20.1	-14.9
ZCBP6	00	Z	100	6	0	8.6	30.4	29.2
ZCBP6	12	Z	100	4	0	7.8	19.6	18.0
03953	00	Z	100	29	0	13.4	22.9	18.6
03953	12	Z	100	30	0	16.0	20.6	13.1
04018	00	Z	100	30	0	19.4	21.3	8.8
04018	12	Z	100	29	0	15.9	16.6	4.7
04220	00	Z	100	29	0	14.1	14.2	1.5
04220	12	Z	100	28	0	13.0	13.6	-4.1
04270	00	Z	100	29	0	19.9	20.6	-5.4
04270	12	Z	100	30	0	22.1	28.1	-17.4
04339	00	Z	100	28	0	11.1	12.9	6.5
04339	12	Z	100	28	0	15.1	15.7	4.4
04360	00	Z	100	29	0	17.4	17.5	1.9
04360	12	Z	100	29	0	16.2	17.8	-7.5
08001	00	Z	100	28	0	21.0	27.3	-17.4
08001	12	Z	100	29	0	22.6	28.8	-17.9
08508	00	Z	100	28	0	58.9	60.2	12.3
08508	12	Z	100	29	0	20.5	30.7	22.9
08522	12	Z	100	29	0	13.4	26.1	22.4
08594	12	Z	100	19	0	22.2	36.5	28.9
60020	00	Z	100	3	0	11.1	48.6	47.3
60020	12	Z	100	2	0	4.0	31.3	31.0
71600	00	Z	100	30	0	18.2	24.6	16.5
71600	12	Z	100	31	0	15.9	19.1	10.5
72201	00	Z	100	30	0	13.2	13.2	0.5
72201	12	Z	100	31	0	14.3	14.6	-2.6
72402	00	Z	100	27	0	15.2	37.0	33.7
72402	12	Z	100	29	0	17.8	25.9	18.9
74494	00	Z	100	23	0	13.8	23.4	19.0
74494	12	Z	100	27	0	14.8	15.5	-4.5
78016	00	Z	100	1	0	0.0	49.0	49.0
78016	12	Z	100	28	0	45.1	56.3	33.6

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	500	11	0	8.6	13.0	9.8
ELML7	12	Z	500	11	0	8.3	14.5	11.9
FNOR	00	Z	500	10	0	11.0	20.4	17.2
FNOR	12	Z	500	11	0	7.7	19.9	18.4
FNOU	00	Z	500	13	0	9.0	19.9	17.8
FNOU	12	Z	500	15	0	9.8	16.7	13.5
FNPH	00	Z	500	12	0	7.2	14.4	12.4
FNPH	12	Z	500	10	0	7.7	10.2	6.7
FNRS	00	Z	500	11	0	17.2	17.2	0.8
FNRS	12	Z	500	14	0	11.3	11.7	2.9
LDWR	00	Z	500	29	0	14.7	14.9	-2.1
LDWR	12	Z	500	28	0	16.6	17.1	-4.3
OVYA2	00	Z	500	11	0	6.5	7.9	4.5
OVYA2	12	Z	500	12	0	11.3	12.6	5.7
OXTS2	00	Z	500	18	0	16.9	17.1	-2.7
OXTS2	12	Z	500	18	0	12.1	12.1	-1.3
ZCBP6	00	Z	500	6	0	5.3	18.0	17.2
ZCBP6	12	Z	500	4	0	8.7	17.6	15.3
03953	00	Z	500	30	0	8.6	18.1	16.0
03953	12	Z	500	31	0	10.3	17.5	14.1
04018	00	Z	500	30	0	10.2	15.0	11.0
04018	12	Z	500	30	0	12.4	15.3	9.1
04220	00	Z	500	30	0	9.7	9.8	1.4
04220	12	Z	500	28	0	11.0	11.3	-2.6
04270	00	Z	500	29	0	13.1	14.6	6.3
04270	12	Z	500	31	0	10.8	11.3	3.4
04339	00	Z	500	28	0	9.8	14.6	10.8
04339	12	Z	500	30	0	15.2	16.6	6.6
04360	00	Z	500	29	0	15.0	15.2	2.7
04360	12	Z	500	29	0	13.8	13.9	1.4
08001	00	Z	500	30	0	12.7	13.9	-5.5
08001	12	Z	500	30	0	13.8	14.0	-2.6
08508	00	Z	500	29	0	8.4	11.2	7.4
08508	12	Z	500	30	0	8.6	14.8	12.0
08522	12	Z	500	30	0	12.6	18.7	13.8
08594	12	Z	500	23	0	7.8	16.1	14.0
60020	00	Z	500	28	0	7.4	17.3	15.6
60020	12	Z	500	28	0	9.9	22.7	20.4
71600	00	Z	500	30	0	16.9	17.0	1.6
71600	12	Z	500	31	0	15.1	15.2	-1.4
72201	00	Z	500	30	0	8.3	8.3	-0.5
72201	12	Z	500	31	0	7.2	7.3	-1.3
72402	00	Z	500	28	0	10.2	11.7	5.6
72402	12	Z	500	31	0	10.6	11.3	3.9
74494	00	Z	500	30	0	12.6	12.6	0.4
74494	12	Z	500	31	0	10.5	10.6	-0.6
78016	00	Z	500	1	0	0.0	24.0	24.0
78016	12	Z	500	28	0	18.5	21.5	11.0

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	100	9	0	0	5.9	0.5	3.7
ELML7	12	V	100	9	0	0	5.8	1.5	1.5
FNOR	00	V	100	8	0	0	5.2	1.1	-0.1
FNOR	12	V	100	9	0	0	5.5	1.1	-0.2
FNOU	00	V	100	13	0	0	4.7	0.2	1.0
FNOU	12	V	100	14	0	0	4.0	0.8	0.8
FNPH	00	V	100	8	0	0	3.7	1.6	0.9
FNPH	12	V	100	9	0	0	4.5	0.6	-2.0
FNRS	00	V	100	11	0	10	4.4	-0.3	-1.2
FNRS	12	V	100	11	0	0	4.5	-1.2	-0.1
LDWR	00	V	100	27	0	0	4.4	-1.6	-1.4
LDWR	12	V	100	29	0	0	5.4	-0.3	-2.0
OVYA2	00	V	100	8	0	0	5.3	-0.5	-1.9
OVYA2	12	V	100	9	0	0	5.4	0.1	-3.4
OXTS2	00	V	100	11	0	0	3.5	-0.9	0.8
OXTS2	12	V	100	10	0	0	4.6	2.1	1.0
ZCBP6	00	V	100	6	0	0	5.2	1.5	0.4
ZCBP6	12	V	100	4	0	0	2.9	0.2	-1.1
03953	00	V	100	29	0	7	7.9	-0.7	0.6
03953	12	V	100	30	0	0	4.1	0.3	-0.3
04018	00	V	100	29	0	0	4.9	0.1	-1.3
04018	12	V	100	28	0	0	5.2	0.8	-2.0
04220	00	V	100	28	0	0	4.8	0.7	0.6
04220	12	V	100	25	0	0	3.7	1.1	0.8
04270	00	V	100	29	0	0	5.9	1.2	1.1
04270	12	V	100	29	0	0	5.7	1.6	2.0
04339	00	V	100	24	0	0	6.0	-0.1	-1.8
04339	12	V	100	27	0	0	5.6	1.0	-2.5
04360	00	V	100	27	0	0	5.4	0.9	-0.9
04360	12	V	100	29	0	0	5.1	1.6	-0.2
08001	00	V	100	28	0	0	4.1	1.2	-0.1
08001	12	V	100	24	0	0	4.4	0.4	-1.2
08508	00	V	100	25	0	0	4.5	1.7	0.7
08508	12	V	100	22	0	0	4.2	-0.7	0.1
08522	12	V	100	29	0	0	4.8	0.4	-0.1
08594	12	V	100	21	0	95	7.0	-1.1	4.7
60020	00	V	100	3	0	0	4.8	-0.8	0.6
71600	00	V	100	31	0	0	4.8	-0.1	-0.8
71600	12	V	100	31	0	0	5.8	0.2	1.3
72201	00	V	100	31	0	0	5.4	1.8	-0.9
72201	12	V	100	30	0	3	8.4	-0.6	0.9
72402	00	V	100	28	0	0	6.4	0.6	0.2
72402	12	V	100	28	0	0	5.8	-0.9	2.1
74494	00	V	100	23	0	0	4.3	-0.9	0.8
74494	12	V	100	26	0	0	4.8	-1.9	2.1
78016	00	V	100	2	0	0	4.0	-1.9	-1.9
78016	12	V	100	28	0	0	6.0	0.2	0.7

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2000

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in $m\ s^{-1}$

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS: Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	500	11	0	0	5.4	0.4	-0.3
ELML7	12	V	500	8	0	0	5.1	0.5	-1.8
FNOR	00	V	500	11	0	0	4.4	-1.0	0.1
FNOR	12	V	500	11	0	0	3.8	-1.3	0.5
FNOU	00	V	500	13	0	0	4.6	0.6	-0.3
FNOU	12	V	500	13	0	0	3.9	-0.9	-1.5
FNPH	00	V	500	11	0	0	4.1	0.6	-0.8
FNPH	12	V	500	10	0	0	2.3	0.3	0.0
FNRS	00	V	500	11	0	10	3.9	0.0	-0.7
FNRS	12	V	500	13	0	0	4.3	0.7	-0.8
LDWR	00	V	500	30	0	3	6.8	-0.5	0.7
LDWR	12	V	500	29	0	0	5.6	-0.1	-0.5
OVYA2	00	V	500	10	0	0	3.9	0.2	-0.3
OVYA2	12	V	500	9	0	0	3.6	0.3	-0.2
OXTS2	00	V	500	13	0	0	4.0	-0.4	0.9
OXTS2	12	V	500	14	0	0	4.3	-0.3	-0.2
ZCBP6	00	V	500	5	0	0	4.6	2.1	-3.1
ZCBP6	12	V	500	4	0	0	5.2	0.0	-2.3
03953	00	V	500	30	0	6	7.6	-1.6	-1.0
03953	12	V	500	31	0	0	4.6	1.4	0.9
04018	00	V	500	30	0	0	6.0	0.7	-0.4
04018	12	V	500	30	0	0	6.0	-0.1	-1.2
04220	00	V	500	28	0	0	6.6	0.7	-1.0
04220	12	V	500	25	0	4	7.8	0.2	-2.4
04270	00	V	500	29	0	0	5.1	0.7	0.1
04270	12	V	500	31	0	0	5.5	-0.3	-0.1
04339	00	V	500	24	0	4	7.1	-1.4	-0.3
04339	12	V	500	30	0	3	7.1	1.0	-0.6
04360	00	V	500	29	0	0	6.5	-0.2	0.3
04360	12	V	500	29	0	0	6.6	-1.3	1.0
08001	00	V	500	30	0	3	5.8	-0.6	-0.1
08001	12	V	500	30	0	0	5.2	-1.1	-1.2
08508	00	V	500	25	0	0	4.7	-1.2	-0.1
08508	12	V	500	25	0	0	5.0	-1.5	-0.8
08522	12	V	500	30	0	0	5.2	2.0	-0.9
08594	12	V	500	24	0	95	7.2	-4.2	2.3
60020	00	V	500	27	0	0	6.5	1.7	1.3
60020	12	V	500	26	0	0	5.2	0.6	-1.3
71600	00	V	500	31	0	0	5.2	1.4	1.1
71600	12	V	500	31	0	0	7.3	0.7	0.9
72201	00	V	500	31	0	0	4.0	0.5	-0.7
72201	12	V	500	31	0	3	6.4	0.1	0.6
72402	00	V	500	29	0	0	4.6	1.2	0.3
72402	12	V	500	31	0	0	4.4	0.3	1.3
74494	00	V	500	31	0	0	6.4	-0.9	1.7
74494	12	V	500	31	0	0	3.6	-0.2	-0.6
78016	00	V	500	2	0	0	4.7	2.1	-1.2
78016	12	V	500	27	0	0	5.4	0.7	1.7

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45